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BIOMEDICAL AND BEHAVIORAL SCIENCES**

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AEROSPACE MEDICINE

COMPLEX PROGRAM OF ERGONOMIC STUDIES 'PILOT' DESCRIBED

Moscow NEDELYA in Russian 3-9 Dec 84 p 4.

[Article by Andrey Potapenko: "Your Health, Pilots!", Leningrad]

[Text] The complex program of ergonomic studies "Pilot" was developed by the Leningrad OKB [experimental design bureau] of biological and medical cybernetics under the direction of Doctor of Technical Sciences V. M. Akhutin, Lenin Prize Laureate. These studies were described by the assistant of the scientific director of the program, Candidate of Technical Sciences A. Ya. Rats.

The rate of the technical development of modern aviation is truly supersonic. Great heights of flights, increase of their duration and range, and saturation with equipment impose high professional and psychophysiological requirements upon the flight personnel. In fact, it is possible to make the signaling instruments in the pilot's cabin more and more complicated. But how can we find out if he is capable of handling such a huge load, such an avalanche of information? The complex program of ergonomic studies is intended for solving such problems. Its purpose is to help physicians in observing the state of health of the pilot from the moment he decides to become a pilot to the day he leaves the aviation service.

In practice, it is a system of six biotechnical complexes each of which performs its special function. The first complex performs professional selection of candidates for the flying profession. The others evaluate the habits of the pilot in the process of training on the training equipment, perform the pre-flight control of the crew, and monitor the condition of the pilots in the air. The system stores all the necessary information about each pilot with the aid of a computer, which helps to evaluate his functional state whenever necessary with consideration of the peculiarities of his organism.

The preflight control complex "Pilot-1" gives in five minutes accurate information about the arterial pressure of the pilot and his body temperature, records an electrocardiogram, checks his tracking response and recent memory. For this, the man will not even have to unbutton his jacket. It is sufficient to insert the index fingers of the left and right hands into special holes in the dashboard, and for the physician to press several buttons, and the sensors will give the necessary information. Four persons can be examined simultaneously. This examination monitors the state of the pilot's organism faster, deeper and more effectively than the usual medical examination.

Instruments monitoring the crew in flight should also be mentioned. Up to the present, the state of the organism in the air was evaluated by the person himself. For example, when the craft captain feels tired, he turns over the controls to his assistant for a while until he recovers. It should not be treated as overcautiousness that such seemingly simple self-monitoring is transferred to a machine. A human being may not even suspect the weakening of his attention or fatigue; sensors will determine his mental state more accurately.

The complex program "Pilot" has undergone first tests in the "Pulkovo" airport and in the Civil Aviation Academy. They showed that the system is highly reliable and efficient. The savings from wide introduction of the program will amount to approximately one million rubles. It is also characteristic that with its aid it will be possible not only to train pilots better, but also to design aircraft with consideration of human potentialities.

The "Pilot" program is unique. It does not have any analogs in the domestic and foreign instrument-making. The program is universal. Simple changes of some parameters will make it possible to use it, for example, in the marine fleet, in automobile transportation, and everywhere where a person is required to have a greater degree of readiness for extreme situations.

10233

CSO: 1840/180

CONFERENCE ON MEDICAL PROBLEMS HELD AT GAGRA

Tbilisi ZARYA VOSTOKA in Russian 23 Nov 84 p 3

[Article by Georgian Information Agency, Gagra, 22 Nov: "Planning of Health"]

[Text] Is it possible to plan health? Yes, it is possible to foresee the prerequisites and conditions of a healthy way of life and to program preventive measures, warnings and early recognition of ailments which will make it possible to prevent the development of grave disease processes.

This was the opinion of the participants of the Fourth Scientific and Practical Conference of the Fourth Main Administration of the Ministry of Health, Georgian SSR, which completed its work today in Gagra. Medical scientists, organizers of health services and practicing physicians from various republics of the country discussed urgent problems of prophylactic medical examination, rehabilitation, and modern methods of examination and treatment of patients with diseases of the cardiovascular system, lungs, stomach and nervous system, and problems of the detection of early forms of malignant tumors etc.

T. R. Topuriya, director of the Fourth Main Administration of the Ministry of Health of the republic told the following to the correspondent of GruzINFORM [Georgian Information Agency]:

Soviet health services are preparing to enter a new stage of their development. This stage is unprecedented not only in our country, but in the world practice. For the first time the state is setting the goal of implementing general prophylactic examination of the entire population. Its main goal is to develop and implement measures directed toward the preservation and strengthening of people's health, to prevent various diseases and to lengthen active creative longevity.

Naturally, Georgian medical workers are also actively preparing for this extensive work. The republic has achieved definite successes in the treatment and prevention of a number of diseases. The following fact, for example, indicates the effectiveness of prophylactic measures: the national economy of Georgia has the country's lowest index of temporary disability of workers and employees.

10233

CSO: 1840/180

SECOND SOVIET-FRENCH SYMPOSIUM ON SPACE CYTOLOGY

Tallinn SOVETSKAYA ESTONIYA in Russian 1 Dec 84 p 3

[Article by V. Ovcharov]

[Excerpt] Results of the latest joint experiments and plans for further scientific cooperation were the focus of attention for participants in the second Soviet-French symposium on space cytology, which concluded on November 30 in Moscow. A TASS correspondent met with the coordinators of the two countries' cooperation in this field of research and invited them to comment on the results of this meeting.

I. Krasnov (Institute of Medical-Biological Problems of the USSR Ministry of Health):

"The first symposium on space cytology took place in Paris last year. These meetings are held within the framework of cooperation between the USSR Ministry of Health and France's National Institute of Public Health and Medical Research in the field of medicine and medical technology. As for the subject of the discussion, the interest in it is understandable. As a part of space biology and medicine, space cytology studies effects of spaceflight factors, particularly zero gravity, on the activity of life's primary units -- animal and plant cells. Undertakings in this direction are of both basic and applied importance; they are already helping to solve practical problems of the medical support of space flights by humans."

M. Butey (director of the Institute of Biomedical Research of the Pierre and Marie Curie University of Paris):

"We now know that functional impairments which are observed in cosmonauts during flights are reversible; they disappear following the return to Earth. It is therefore important to develop methods and instruments which would make it possible to observe changes on the cellular level directly in orbit. Researchers in the field of space cytology have to solve a considerable number of complex problems; they have to develop automatic methods for growing cell cultures in orbit and thoroughly ascertain how zero gravity affects the structure, metabolism and functions of cells. It is particularly interesting to study these effects for cells of the nervous, muscular and other systems of the body.

"The first joint studies in this direction have already been made. In particular, in Moscow we discussed very interesting results obtained with the aid of the Soviet biological satellite 'Kosmos-1514'."

AGROTECHNOLOGY

UDC 547.972:582.632

EFFECTS OF PARASITIC FUNGI ON BIOSYNTHESIS AND TRANSFORMATION OF PTEROCARPANS AND ISOFLAVONES IN TRIFOLIEAE PLANTS: A LITERATURE REVIEW

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGOYA in Russian Vol 20, No 6,  
Dec 84 (manuscript received 30 Aug 83) pp 723-732

POPRAVKO, S.A., KONONENKO, G.P. and SOKOLOVA, S. A., All-Union Scientific  
Research Institute of Protein Biosynthesis, Moscow

[Abstract] A literature study was conducted on research accomplished during the past decade on the effects of parasitic fungi on the biosynthesis and transformation of pterocarpans and isoflavones in Trifolieae plants. It has been demonstrated that in response to infection by various Fungi Imperfecti the plants in question embark on de novo synthesis of pterocarpans (medicarpin, inermin, 4-methoxyinermin) and 7,2<sup>1</sup>,6<sup>1</sup>-substituted isoflavones (arvensan, sativan, isosativan, vestitol, isovestitol). These compounds exert a marked effect on inhibiting growth of the fungi (ED<sub>50</sub> ≤ 50 ug/ml), with the isoflavones showing greater antimycelial activity than the pterocarpans. However, some fungal species are resistant to the effects of these compounds, among them Kabatiella, Stemphylium, Ascochyta, Colletotrichum, Leptosphaerulina, etc. Certain aspects of the metabolic sequences and transformations of these compounds are also discussed, with emphasis that such metabolic versatility of these perennial legumes underlies their resistance to some mycotic diseases. References 39: 3 Russian, 36 Western.  
[1717-12172]

UDC: 632.937.1

STABILITY OF PARASITE-HOST SYSTEM AND EFFECTIVENESS OF ENTOMOPHAGES

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 98, No 5, Sep-Oct 84  
pp 307-311

MARSHAKOV, V. G., All-Union Scientific Research Institute of Plant Protection,  
Leningrad

[Abstract] In parasite-host systems, we are dealing with a paradox according to the general theory of systems, in that the greater the number of species of parasites developing on a single host, the less stable the host-parasite system. The stability of the trophic level of phytophages increases with an increase in the number of competing species at this level and decreases with an increase in the number of species of parasites competing and developing at the trophic level of the phytophages. The population of the host and its fluctuations should thus be higher the greater the number of parasites of the host competing with each other and the less stable the system as a whole. This hypothesis formally contradicts the general theory of stability of systems. The effectiveness of an entomophage consists of a threshold of search capability, i.e., the population of host sufficient that the rate of search and destruction of the host follows a rising curve, plus a level of host population at which the entomophage stabilizes, plus the time interval necessary for the transition from the first position to the second. The factors which influence the potential effectiveness of parasites are discussed. The problem of stability of parasite-host systems and the effectiveness of entomophages cannot be related to the number of parasite species in a system and percentage of infection of host organisms alone. It is taken as a working hypothesis that the competition between parasites decreases effectiveness of each parasite species as well as the rate of response of the entire parasite system to changes in host population. It is concluded that the problem of stability of pathogen, selection and evaluation of entomophages can be solved only on the basis of a careful analysis of the parasite-host system structure, with particular attention given to the qualitative aspect of relationships between parasites in complexes and the rate of response to fluctuations in host population. References 19: 1 Russian, 18 Western.  
[1618-6508]

UDC: 633.111:575.1:547.96:664.64.016.8

HYBRIDOLOGIC ANALYSIS OF COMPONENT COMPOSITION OF VARIETIES OF SOFT SPRING WHEAT AND ITS SIGNIFICANCE IN DETERMINATION OF FLOUR QUALITY

Moscow GENETIKA in Russian Vol 20, No 9, Sep 84 (manuscript received 8 Jan 82; in final form 23 Jan 84) pp 1528-1535

BEBYAKIN, V. M., DUSHAYEVA, N. A., and CHERVAKOVA, T. G., Scientific Research Institute of Agriculture of the Southeast, Saratov

[Abstract] A study is reported of the nature of heredity of the component composition of gliadin and its role in determining the technological quality of flour of soft spring wheat. Varieties with contrasting gliadin component composition and baking qualities were utilized in the experiments. Electrophoretic analysis was performed on  $F_1$  and  $F_2$  grains of individual plant, as well as  $F_4$  seed grains grown in randomized field experiment blocks. Gliadin was separated by recognized methods and the positions of the components in the gliadin spectra determined by the relative electrophoretic mobility. Statistical processing of the result of technological analysis of the hybrids grouped by types of identified blocks in  $F_2$  revealed significant differences in terms of protein and starch content in the flour. The component composition of wheat flour gliadin is found to be inherited by groups and to influence a number of characteristics of flour quality. Figures 3; references 25: 23 Russian, 2 Western.

[127-6508]

BIOCHEMISTRY

NEW CENTER FOR LUMINESCENT ANALYSIS OF BIOLOGICAL SUBSTANCES

Moscow GUDOK in Russian 12 Jan 85 p 4

[Text] Scientists of the Riga Medical Institute have proposed determining the structure and quantitative content of substances in biological tissues and fluids according to the color spectrum which is formed by the luminescence of their molecules. Luminescence allows the structure and quantitative content of various compounds to be determined by their spectra. Instrument readings are processed by a microcomputer, and the results appear on a screen or on printouts. Errors are practically precluded here, since the system checks its own measurements repeatedly.

The apparatus for this is capable of detecting light signals of individual photons and recognizing even each individual molecule from these signals. Interaction of biologically active substances, including enzymes, hormones and vitamins, with living cells can be studied in this manner. This opens up new possibilities for diagnosing many illnesses.

The Latvian SSR Ministry of Health has organized a republic center for luminescent analysis in a laboratory of the medical institute, which will further the broad introduction of its developments into medical practice. This promising new scientific direction is being advanced through joint efforts of physicians, biologists, physicists, chemists and computer specialists.

FTD/SNAP  
CSO: 1840/200

UDC 36.613.362

EFFECTS OF NEW PLANT GROWTH REGULATOR EBF-5 ON HEPATIC ALANINE p-HYDROXYLASE ACTIVITY

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 9, Sep 84 (manuscript received 3 Jan 84) pp 792-793

NAGASHYAN, O.Z. and AGADZHANYAN, S.M., Branch, VNIIGINTOKS [expansion unknown], USSR Ministry of Health

[Abstract] Outbred rats were used to study the effects of a new plant growth regulator EBF-5 on alanine p-hydroxylase (APH) activity in the postmitochondrial liver fraction. Within 30 days of daily administration of EBF-5 in doses of 62.27 mg/kg (1/100 LD<sub>50</sub>) or 6.227 mg/kg (1/1000 LD<sub>50</sub>) per os, APH activity was elevated by 17-22%, a statistically significant difference in comparison with control animals. A 19% elevation was observed after 3 months with the highest dose (62.27 mg/kg), while after 6 months of constant administration an insignificant elevation was apparent. It appears that EBF-5 interacts with the mono-oxygenase system of the endoplasmic reticulum in hepatocytes, and that adaptive mechanisms compensate for the induced changes.

[1023-12172]

UDC 616-006-02:614.47

MODIFICATION OF CYTOGENETIC EFFECTS OF CYCLOPHOSPHAN BY MICROBIAL TULAREMIA VACCINE IN RATS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 9, Sep 84 (manuscript received 24 Feb 84) pp 793-794

NERSESYAN, A.K.

[Abstract] Studies on the myelokaryocytes of rats immunized with killed and viable tularemia vaccines showed that such immunization had no effect on the chromosomal apparatus. However, in doses of 5-500 million live cells, the vaccine protected against cyclophosphan-induced chromosomal changes when the agent was administered 15 days later in a dose of 25 mg/kg. Pretreatment

with 2.5 million live and 500 million killed cells was ineffective in modifying the effects of cyclophosphan. The effects of the live vaccine were attributed to modification of cyclophosphan metabolism either by the effects of endotoxin or some other microbial metabolite(s), or by direct interaction with the drug. This article has been deposited with VINITI.  
[1023-12172]

UDC 581.15

CYTOGENETIC EFFECTS OF LINURON AND SIMAZIN HERBICIDES ON CREPIS CAPILLARIS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 9, Sep 84 (manuscript received 14 Jun 83) pp 741-744

VOSKANYAN, A.Z. and AVAKYAN, V.A., Nature Protection Department, Department of Nature Protection of Armenia, All-Union Scientific Research Institute of Nature, USSR Ministry of Agriculture

[Abstract] The cytogenetic effects of the pre- and post-emergence herbicides linuron and simazin [sic] were tested in 0.1-0.05% concentrations on the seeds and shoots of Crepis capillaris. Cell cycle analysis showed that both herbicides had mutagenic effects in all phases of the cycle, but that the S phase was particularly susceptible to these herbicides. In the S phase simazin was more damaging than linuron, with most of the chromosomal aberrations consisting of fragmentation with predominance of chromatic deletions. Chromatid exchange-type abnormalities were not detected. References 8 (Russian).

[1023-12172]

UDC 577,122,582:579,253,4:579,222,3

SELECTION AND STUDIES ON DL-ALPHA-AMINOBUTYRIC ACID-RESISTANT MUTANTS OF SERRATIA MARCESCENS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 9, Sep 84 (manuscript received 5 Dec 83) pp 735-739

ARMANDZHYAN, A.O. and OGANEZYAN, M.G., Scientific Research Amino Acid Technological Institute, USSR Main Board of Industrial Microbiology; Institute of Experimental Biology, Armenian SSR Academy of Sciences

[Abstract] Ultraviolet irradiation was used in the induction and selection of mutant strains of Serratia marcescens showing increased resistance to DL-alpha-aminobutyric acid, an analog of the amino acid valine. Approximately 15% of the mutant colonies with resistance to DL-alpha-aminobutyric acid, obtained with a frequency of  $10^{-7}$ , produced in excess of 10 g/liter of valine. In terms of valine production, this represented a 4-5-fold improvement over

the parental *S. marcescens* ATCC 9986 strain, and indicates that selection of mutants resistant to its congener can be a promising approach in selecting high-value producers. Figures 1; references 16: 5 Russian, 11 Western.  
[1023-12172]

UDC 576.809.8+631.547

#### CYTOKININ ACTIVITY OF PRODUCTS OF THERMOPHILIC METHANE FERMENTATION

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGOYA in Russian Vol 20, No 6, Dec 84 (manuscript received 18 Nov 83) pp 793-797

PODLEPA, Ye. M. and MIKHLIN, E.D., Institute of Biochemistry imeni A.N. Bakh, USSR Academy of Sciences, Moscow

[Abstract] Studies were conducted on products obtained in thermophilic methane fermentation of acetone butyl malt to determine whether they possessed phytohormonal activities. Biological testing showed the lack of auxin and gibberellin properties. However, trials with Amaranthus caudatus shoots revealed the presence of factors with cytokinin activity, as indicated by the stimulation of pigment formation. References 20: 19 Russian, 1 Western.  
[1717-12172]

UDC: 577.150.6

#### COMPARATIVE ANALYSIS OF QUALITATIVE AND QUANTITATIVE INDICES OF EXTRACELLULAR DEOXYRIBONUCLEASE ACTIVITY OF STAPHYLOCOCCUS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84 (manuscript received 20 Apr 84) pp 92-94

KOROLEVA, V. V. and SHMITE, I.A., Institute of Microbiology imeni Avgust Kirkhenshteyn, Latvian SSR Academy of Sciences

[Abstract] Staphylococcus nuclease is an extracellular enzyme. Its significance in vivo is not understood. It has been suggested that the nuclease splits nucleic acids into fragments which are transported with the cells and resynthesized. The pathogenicity of the staphylococcus has been found to correlate with biosynthesis and excretion of extracellular nuclease. Staphylococcus nuclease is not presently produced in the USSR. The purpose of this study was to select a quantitative method for determination of nuclease and compare the results obtained by quantitative and qualitative methods for a number of staphylococcus strains isolated from healthy and diseased persons to determine the correlation between the presence of nuclease and pathogenicity in staphylococcus. The activity of DNAase was compared by

qualitative and quantitative methods in 120 strains of staphylococcus. Full correlation between qualitative and quantitative tests to determine activity was not observed in the strains of staphylococcus, and the qualitative test cannot be used to conclude absence of enzyme activity. Presence of nuclease is not a distinguishing characteristic of staphylococcus pathogenicity.

References 15: 3 Russian, 12 Western.

[1627-6508]

BIOPHYSICS

UDC 577.345

WAYS OF OPTIMIZATION OF LIGHT ENERGY TRANSFORMATION IN PRIMARY STAGES OF PHOTOSYNTHESIS. NECESSITY OF OPTIMIZATION OF PHOTOSYNTHETIC UNIT STRUCTURE AND METHOD FOR CALCULATING EFFICIENCY

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 6, Nov-Dec 84  
(manuscript received 1 Dec 83) pp 1651-1656

FETISOVA, Z. G. and FOK, M. V., Interfaculty Scientific Research Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy, Moscow State University imeni M. V. Lomonosov; Physics Institute imeni P. N. Lebedev, USSR Academy of Sciences, Moscow

[Abstract] Various primary photosynthetic processes have been studied to determine energy migration and light accumulation factors. Results have shown that quantum yield of primary energy charges in reaction centers occur only with pronounced optimization of photosynthetic unit parameters. The present article reports on study of a system with a given number of reaction centers and light-collecting antennas with calculated numbers of molecules. With rapid energy migration the upper limit of quantum yield of primary charge requires three experimental parameters, but even with these, calculated and experimental results diverge sharply. Thus, the structure of photosynthetic units *in vivo* must be optimized for accurate results. A high rate of energy migration alone did not provide high transmission of energy from antennas to reaction center. The authors propose a new method for calculating input-output values. Their introduction of a parameter for spectral heterogeneity of the antenna reduced the number of stages in energy migration by a factor of 4, while time involved was cut in half. Figure 1; references 11: 3 Russian, 8 Western.

[1654-12131]

UDC 577.345

WAYS OF OPTIMIZATION OF LIGHT ENERGY TRANSFORMATION IN PRIMARY STAGES OF PHOTOSYNTHESIS. OPTIMIZATION OF LATTICE STRUCTURE OF UNIFORM PHOTOSYNTHETIC UNIT

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 6, Nov-Dec 84  
(manuscript received 1 Dec 83) pp 1657-1663

FETISOVA, Z. G., FOK, M. V., SHIBAYEVA, L. V. and BORISOV, A. Yu., Inter-faculty Scientific Research Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy, Moscow State University imeni M. V. Lomonosov; Physics Institute imeni P. N. Lebedev, USSR Academy of Sciences, Moscow

[Abstract] Continuing studies [this journal 18,6, pp 1651-1656] of photosynthetic unit structure, the authors studied the structure of the macroscopic lattice of a given type and modeled energy transfer of photosynthetic unit structure (PUS) antenna, suggesting its inductive-resonance mechanism and dipole-dipole interaction between molecules during energy transfer. A right-angle lattice with infinite two-dimensional aggregates, formed with the help of translational symmetry. Parameters of the model are discussed. Results suggest two consequences for *in vivo* systems: If the PUS macro-antenna display a specific anisotropy of intermolecular spaces, then an elongated form will emerge, and if the reaction centers *in vivo* are grouped into clusters, then the light-collecting antennas cannot be uniform and isotropic. Figures 6; references 12: 5 Russian, 7 Western.  
[1654-12131]

UDC: 591.174.3+598.2

ESTIMATING ENERGY EFFICIENCY OF FLYING APPARATUS OF BIRDS

Moscow DOKLADY AKADEMII NAUK SSR in Russian Vol 277, No 2, Jul 84  
(manuscript received 9 Feb 84) pp 489-493

BORIN, A.A. and KOKSHAYSKIY, N.V., Institute of Evolutionary Morphology and Ecology of Animals imeni A.N. Severtsov, USSR Academy of Sciences, Moscow

[Abstract] The energy efficiency of a bird or an aircraft is a numerical criterion characterizing the degree of conversion of the energy of the motor or flying musculature into transportation work. The effectiveness of biochemical energy conversion in the organism of the bird is thus ignored. Studies of the flight energy of birds and standard data on aircraft in previous studies have indicated that birds have the advantage in terms of the ratio of power consumed to weight carried. However, studies involving weighing of large numbers of birds before and after long migrations over open water where resting and feeding were both impossible, in comparison to studies of fuel consumption in aircraft, indicate no particular advantage of birds over aircraft in terms of the product of mass carried times distance traveled divided by fuel consumed. Figures 2; references 15: 9 Russian, 6 Western.  
[1604-6508]

BIOTECHNOLOGY

UKRAINIAN REPUBLIC CONFERENCE ON 'PROSPECTS OF DEVELOPMENT AND PRACTICAL USE OF BIOTECHNOLOGIES'

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 5, Sep-Oct 84  
(manuscript received 11 Feb 84) pp 107-110

[Article by V. S. Podgorskiy and Ye. N. Pisarchuk]

[Text] The republic conference on "Prospects of Development and Practical Use of Biotechnologies" convened in Kiev from 20 to 22 December 1983; it was organized by the Scientific Council for Problems of Physiology and Biochemistry of Microorganisms of the Ukrainian Academy of Sciences, Institute of Microbiology and Virology imeni D. K. Zabolotnyy, Ukrainian Academy of Sciences, and the Ukrainian Microbiological Society.

About 160 people representing 30 institutions and industrial enterprises referable to different agencies of the republic participated in the conference.

In his opening remarks, V. V. Smirnov, corresponding member of the Ukrainian Academy of Sciences, director of the Institute of Microbiology and Virology imeni D. K. Zabolotnyy, Ukrainian Academy of Sciences, and chairman of the Organizing Committee, stressed the timeliness of the conference, urgency of the problem discussed and importance of the issues considered in the light of the decrees of the Party and government.

The papers delivered at the conference were surveys. They submitted a comprehensive analysis of the status and prospects of development of research on biotechnology in the most important sectors of the national economy. In particular, they dealt with problems of recovery of products of microbial synthesis and preparations of bacterial cultures, microbial transformation and destruction of complex chemical compounds. There was also discussion of issues related to the biotechnological bases of geological microbiology and immunology.

Use of nontraditional types of raw materials in the microbiological industry (natural gas, methyl and ethyl alcohol, hydrolysates of agricultural waste, etc.) opens up new possibilities for expanding the feed base of livestock farming. New races of yeast and bacteria are being used as producers of proteins; more refined designs of fermenters are being developed and tested; production capacities are increasing and expanding; productivity of existing technological processes is increasing. These questions were discussed in

detail in the paper of V. S. Podgorskiy (Institute of Microbiology and Virology, Ukrainian Academy of Sciences, Kiev).

I. Ya. Zakharova and R. I. Gvozdyak (IMV [Institute of Microbiology and Virology, Ukrainian Academy of Sciences, Kiev]) submitted data on recovery and practical use of microbial polysaccharides in many sectors of the national economy and medicine. After several decades of purposeful research there has been a significant increase in number of polysaccharides, as well as in the range of producers and substrates for their biosynthesis. Data were submitted on the structure and physicochemical properties of biopolymers.

The history of inception of industrial production of vitamins with use of microorganisms was the topic of the paper of T. Ye. Popova (Institute of History of Natural Science and Engineering, USSR Academy of Sciences, Moscow). She demonstrated the trends and established the patterns of development of scientific bases of the technology for recovery of vitamins, use of which in agriculture and medicine is consistently increasing.

T. I. Bilay and L. A. Zakordonets (IMV) reported on the prospects of using thermophil micromycetes in the microbiological industry. Studies were made of the physicochemical properties of proteases, cellulases and amylases of fungal origin. It was established that these enzymes have high thermal stability and considerable rate of substrate hydrolysis. Their species specificity was demonstrated.

O. A. Kirilenko (Technological Institute of the Food Industry imeni M. V. Lomonosov, Odessa) reported on the results of research on biosynthesis of coenzyme A by representatives of bacteria of the genus *Brevibacterium*. Nutrient media have been obtained, the production properties of a domestic producer were improved through breeding and its cultivation conditions have been optimized; means have also been found for breaking down the cell membrane in order to recover higher yields of this product.

The paper of G. M. Shavlovskiy (Lvov department of the Institute of Biochemistry imeni A. V. Palladin, Ukrainian Academy of Sciences) concentrated in particular on control of flavin biosynthesis in microorganisms. It was shown that exact knowledge of the mechanisms of expression of genes that code the enzymes of different biosynthetic processes makes it possible to design strains with high biosynthetic activity.

The paper of B. P. Matselyukh (IMV) surveyed the basic methods of gene engineering and prospects for its development in the future. The techniques for gene engineering permit isolation of DNA, its separation, building recombinant molecules *in vitro* and their insertion in living cells for gene expression. Examples of building vectors and recombinant DNA were provided with regard to different objects—antibiotic and amino acid producers; the bases of gene cloning were demonstrated. There was comprehensive discussion of the method of protoplast fusion.

Phagolysis of production cultures causes much detriment to the microbiological industry. In his paper, Ya. G. Kishko (IMV) analyzed the causes of phagolysis of valuable industrial cultures of microorganisms and steps to control them.

He discussed procedures for "treatment" of cultures, artificial lysogenization of producers, as well as use of chemicals, the action of which is aimed at preventing lytic development of temperate phages.

Yu. R. Malashenko (IMV) submitted a survey of mathematical methods of investigation, methods of statistical processing of results of research, planning of multifactor experiments. He cited examples of using mathematical methods in the study of growth of methane-oxidizing bacteria.

The papers of Ye. I. Kvasnikov and N. K. Kovalenko (IMV), V. V. Smirnov and S. R. Reznik (IMV), Ye. I. Andreyuk and A. F. Antipchuk (IMV) dealt with a new and intensively developing direction of research based on use of preparations of microorganisms cultures in the national economy.

Ye. I. Kvasnikov and N. K. Kovalenko reported on the results of studies on recovery and practical use of *Lactobacillus* preparations in livestock farming and for silage of feed of plant origin. Highly active strains of *Lactobacilli* have been bred, which synthesize vitamins and have specific antagonism for different groups of pathogenic and conditionally pathogenic microorganisms. The technology for recovery of dry biologicals based on *Lactobacilli* was developed, together with the Biopreparat All-Union Production Association of Glavmikrobioprom [Main Administration of the Microbiological Industry]. It was shown that they are efficacious for both prevention and treatment of gastrointestinal diseases in farm animals, as well as preservatives for silage. Agents produced on the basis of aerobic sporulating bacteria can also be used for prevention and treatment of these diseases (V. V. Smirnov, S. R. Reznik). Some basic issues were discussed pertaining to formation of associations of sporulating aerobes. The basic properties of monocultures determining the therapeutic and preventive efficacy of a product were described: antibiotic and enzymatic activity, resistance to antibiotics, etc. Studies were pursued of the distinctions of the mechanism of influence of cultures on the macroorganism. Criteria were offered for evaluating the safety of agents.

Pretreatment with enzyme products (pectofoetidin, protosubtilin, glucoamylase) of feed included in the usual diet of farm animals improves its assimilation (Ye. F. Grigor'yev, A. A. Baralevich, Ladyzhin Enzyme Product Plant). A method was proposed for use of these agents that provides for additional weight gain in calves and pigs.

Bacterial fertilizers are one of the resources for augmenting agricultural production. The paper of Ye. I. Andreyuk and A. F. Antipchuk submitted information about production and use of bacterial fertilizers in agriculture. Special attention was devoted to use of nitrugin in the farms of this republic. They emphasized the tasks put to microbiologists and plant breeders: search and breeding of active strains of *Rhizobium*; development of methods of optimizing their growth; refinement of technology for production of the agent and technology for its use. The speakers also devoted attention to the efficacy of using azotobacterin.

V. I. Bilay (IMV) discussed the basic theoretical and practical aspects of the current problem of bioconversion of plant raw materials by micromycetes.

Fungus cellulases can be used to improve digestibility of coarse feed used in the diet of farm animals, to enrich it with protein and other physiologically active metabolites by means of direct transformation of cellulose and other polymers it contains. In addition, cellulases of fungal origin may be promising in the production of glucose, with its subsequent fermentation and recovery of ethanol and other products of fermentation.

A toxic strains of thermophil and mesophil micromycetes were developed at the IMV; they grow intensively on various types of plant raw materials, and they have a specific set of cellulases. The technology is being developed for recovery of fungus-enriched plant substrates and methods of using it.

Questions of environmental protection and bacterial extraction of metals from ore were the topic of the papers of P. I. Gvozdyak (Institute of Colloid Chemistry and Chemistry of Water, Ukrainian Academy of Sciences, Kiev), Yu. S. Babenko and G. I. Tyrygina (Dnepropetrovsk State University).

It was shown that destructor microorganisms are the basis of modern biotechnology of water. Several new biotechnologies for aerobic and anaerobic treatment of liquid sewage to remove diverse xenobiotics were developed and introduced into production (P. I. Gvozdyak).

Use of heterotrophic microorganisms for extraction of metals from ore--bacterial hydrometallurgy--is one of the relatively new directions of technical microbiology. Yu. S. Babenko and G. I. Tyrygina reported on the results of studies dealing with extraction of manganese from ore. A study was made of the physiology of manganese-extracting bacteria; the rôle of their metabolites in manganese extraction has been determined.

N. S. Dyachenko (IMV) and S. V. Komissarenko (Institute of Biochemistry, Ukrainian Academy of Sciences, Kiev) reported on the prospects of using modern biotechnology in medicine and veterinary practice for diagnosing human and animal diseases. A new branch of biotechnology is being developed--immuno-biotechnology, which makes use of the property of immunocompetent cells to synthesize and secrete biologically active compounds, such as antibodies, growth factors, interferon and others. Analysis was made of the possibility of using the techniques to recover monoclonal antibodies for development of highly specific and active diagnostic agents.

The papers were discussed in a creative atmosphere of mutual interest. The conference adopted a decision to continue with the development of work on biotechnology in this republic and intensify its coordination; it also outlined several measures to expedite introduction of scientific research developments into the national economy.

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10,657  
CSO: 1840/110

UDC 576.8

OPTICAL-STRUCTURAL COMPUTER ANALYSIS OF YEAST POPULATION IN COMPARISON WITH CYTOLOGY, CELL PHYSIOLOGY AND COMPOSITION OF CHEMOSTATIC CULTURE BIOMASS UNDER DIFFERENT RATES OF DILUTION

Moscow IZVESTIY AKADEMII NAUK SSSR; SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 84 (manuscript received 30 Apr 83) pp 855-864

POZMOGOVA, I.N., RABOTNOVA, I.L., YANOVSKIY, K.A., SHIKHER, V.I., KUIMOVA, T.F., SHULIGOVSKAYA, Ye.M., KOZLOV, Yu.G., BERESTENNIKOVA, N.D., TSVID, Ye.Ye., ZAIKINA, A.I., RYABCHUK, V.A. and LYAGINA, I.A., Institute of Microbiology, USSR Academy of Sciences, Moscow, All-Union Scientific Research Institute of Protein Synthesis, Moscow

[Abstract] Chemostat cultures were used to compare characteristics of the state of yeast cells with the aid of optical-structural computer analysis (OSCA). *Candida utilis* BKMY-1668 was grown on a medium with ethanol and *Candida maltosa* sp. was grown on a medium with paraffin. When the yeast cultures reached a stationary state, samples were taken with  $D=0.345$ ,  $0.300$ ,  $0.250$ ,  $0.200$ ,  $0.150$ ,  $0.100$ ,  $0.05$  hours $^{-1}$ ;  $\chi$ ,  $S_{res}$ ,  $Y$  and metabolites in the culture fluid were determined and the biomass composition was analyzed. Morphological properties of cell populations were studied by OSCA and ultra-thin sections of cells were studied. Data obtained by the different methods were approximately the same. Modifications of OSCA are suggested to facilitate its use in microbiological processes. These included decreasing values of conventional optical density of the cell cytoplasm in its points measured separately, designated as  $\sigma$ , to indicate the degree of cell structure development and the ratio in the cell cytoplasm of segments with different optical density, designated by  $S$ , to indicate the degree of heterogeneity of the cytoplasm matrix. Higher index of  $\sigma$  was found in cells of chemostat cultures of higher dilution and increase of indicator  $S$  was associated with a decrease of  $D$ . Figures 4; references 18: 14 Russian, 4 Western.

[1682-2791]

UDC 614.449.57:[576.895.771:591.617:579.852.11]

USE OF BACILLUS THURINGIENSIS BERL. 14th SEROTYPE AGAINST BLOODSUCKING MOSQUITO LARVAE

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 3, May-Jun 84 (manuscript received 4 Aug 82) pp 69-73

VOLZHINSKIY, D. V., SOKOLOVA, E. I., KOSOVSKIKH, V. L., KULIYEVA, N.M., BIKUNOVA, A. N., GANUSHKINA, L.A. and ERLIKH, V. D., All-Union Scientific Research Institute of Applied Microbiology, Serpukhov

[Abstract] Effectiveness of *Bacillus thuringiensis* var *israelensis* of the 14th serotype against laboratory and natural mosquito larvae was investigated in two different climatic zones. Three compounds: R-153-78 from France, a preparation from Abbott Company and a bactoculicide made in the USSR were evaluated on following mosquitoes: *Aedes aegypti* L., *Culex pipiens molestus* L., *Anopheles atroparvus* Thiel., *An. stephensis* Liston and *An. sacharovi* Favre. It was shown that these preparations are highly effective larvicides, useful in controlling mosquitoes under various physical and geographical conditions. Both malarial and non-malarial mosquitoes were affected. Suggested concentration for the application of R-153-78 and "Abbott preparation" was 0.2 mg/l and for the bactoculicide -- 0.4 mg/l. The difference in the sensitivity of various mosquito families should be taken into consideration when applying these agents. References, 18: 8 Russian, 10 Western.  
[1674-7813]

UDC 576.8:577.158:541.136

FLOW-THROUGH MICROBIAL ELECTRODES IN DETERMINATION OF BIOCHEMICAL OXYGEN DEMAND OF NUTRIENT MEDIA

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 6, Dec 84 (manuscript received 26 Apr 83) pp 831-835

KULIS, Yu.Yu. and KADZYAUSKENE, K.V., Institute of Biochemistry, Lithuanian SSR Academy of Sciences, Vilnyus

[Abstract] Flow-through microbial electrodes were used in the determination of the biochemical oxygen demand (BOD) of nutrient media, using the bacterial cells *E. coli* K-12, the yeast cells *Hansenula anomala*, and the mixed flora of active sludge. The sensitivities of these electrodes were, respectively, 65.5, 112.1 and 32.8%  $O_2/1$  mM glucose. Higher sensitivities were exhibited by the *E. coli* and sludge electrodes during oxidation of pyruvate (120 and 82.3%  $O_2/1$  mM substrate), while the yeast electrode was remarkable for relative lack of sensitivity in the oxidation of sucrose (9.3%  $O_2/1$  mM substrate). The response time of the various electrodes varied from 8 to 35 min, depending on the substrate. The electrodes retained their activities for 33-38 days.

In the determination of the BOD for Ryder's and Schopfer's media the E. coli electrode exhibited the greatest sensitivity. Figures 3; references 10: 6 Russian, 4 Western.  
[1717-12172]

UDC 577.156+577.150.7

#### HYDROPHOBIC IMMOBILIZATION OF FUNGAL BETA-GALACTOSIDASES ON INORGANIC CARBOXY SUPPORTS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 20, No 6 Dec 84 (manuscript received 19 Apr 83) pp 817-822

SAMOSHINA, N.M., LOTMENTSEVA, Ye.Yu., BORISOVA, V.N. and NAKHAPETSYAN, L.A., All-Union Scientific Research Biotechnical Institute, Moscow

[Abstract] Optimum immobilization conditions were determined for Penicillium and Curvilaria beta-galactosidases on the inorganic support Silokhrom S-80, modified by silylundecanoic acid. The optimum conditions for both enzymes consisted of the use of 0.2 M acetate buffer, pH 4.2. Maximum activity yields for the Penicillium enzyme were obtained with an enzyme:support ratio of 0.5:1, and a reaction time of 90 min. For the Curvilaria beta-galactosidase the optimum enzyme:support ratio was 0.2:1 and a reaction time of 120 min. Addition of 0.1 M NaCl to the reaction mixture was found to enhance the activity yield of the Penicillium enzyme, but diminish that of the Curvilaria enzyme. Figures 5; references 13: 6 Russian, 7 Western.

[1717-12172]

UDC: 66 3.18(088.8)

#### PRODUCTION OF CITRATES FROM N-ALKANES BY MICROBIAL SYNTHESIS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84 (manuscript received 23 May 84) pp 108-112

KARKLIN', R. Ya., PELTSMANE, I. Zh. and RAMINYA, L. O., Institute of Microbiology imeni Avgust Kirkhenshteyn, Latvian SSR Academy of Sciences

[Abstract] Microbiological production of organic acids from inexpensive raw materials such as industrial wastes, for example, paraffin waste products of petroleum refining, has been studied for some time. Citric acid sodium salts are produced by this method for use as detergents and surfactants. The authors have performed a series of experiments on the production of technical salts of citric acid. A yield of 80-99% has been obtained in the production of the trisubstituted sodium salt  $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7 \cdot 5.5 \text{ H}_2\text{O}$ . Tables present the minimum and maximum yields achieved in the production of citric acid salts from fermentation solutions of N-alkanes. Methods have been developed for production of citric acid, trisubstituted sodium citrate and monosubstituted

potassium citrate of reagent purity by the use of physical-chemical methods and ion exchange processes. The yield of crystalline citric acid is up to 48.5% of its content in the fermentation solution, the yield of sodium and potassium salts is 44 to 63 and 26 to 48%. References 23: 8 Russian, 15 Western.

[1627-6508]

UDC: 661.734.1.03.)437)

#### RESULTS OF INTRODUCTION OF CITRIC ACID PRODUCERS BASED ON LICENSE AGREEMENTS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84  
(manuscript received 23 May 84) pp 113-115

KARKLIN', R. Ya., PROBOK, A.K. and CHERKASHIN, A. A., Institute of Microbiology imeni Avgust Kirkhenshteyn, Latvian SSR Academy of Sciences

[Abstract] Highly active citric acid producing strains of *Aspergillus niger* R-1 and R-3 have been produced by mutagenesis at the authors' institute. The mutant strains were isolated by artificial selection of altered forms induced by physical and chemical mutagens. The yield of citric acid from sugar under laboratory conditions reaches 100%, citric acid representing 95 to 99% of the total acids synthesized, oxalic acid not over 1%. Firms in Czechoslovakia, Bulgaria, France, Turkey and Yugoslavia have become licensed partners for this technology. The first licensed plant in Czechoslovakia achieved a maximum yield of citric acid from molasses of 86%, the solution after fermentation containing almost 99.9% citric acid of total acids. The French firm achieved an increase in citric acid production of 20% as a result of the licensed technology. References 7 (Russian).

[1627-6508]

UDC: 576.8:663.1

#### PHYSIOLOGICAL AND BIOTECHNOLOGICAL ASPECTS OF REGULATION OF YIELD OF PRODUCTS SYNTHESIZED BY MICROORGANISMS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84  
(manuscript received 2 Apr 84) pp 56-71

SHVINKA, Yu. E., Institute of Microbiology imeni Avgust Kirkhenshteyn, Latvian SSR Academy of Sciences

[Abstract] Biotechnology involving the use of microorganisms for the synthesis of products can be used to produce fuels, protein for feeds and food, medical products and for purification of the environment by the consumption of wastes. This article presents an analysis of certain physiological aspects of increasing the yield of products synthesized by microorganisms.

Improvement of processes is possible by the use of more active producing strains, variation of raw materials and improvement of apparatus and conditions. Studies of mutants of lysine-synthesizing bacteria *Brevibacterium flavum* indicate that the vital activity of these bacteria maintains a high rate of catabolism for as long as possible. The natural tendency of organisms to maintain balanced metabolism can be exploited in efforts to increase synthesis yields. A table of nonproductive energy expenditures in the metabolism of microorganisms is presented. It was found that the increase in nonproductive energy expenditure in bacteria is related to maintenance of transmembrane electrochemical potential of protons in *Br. flavum* with elevated passive permeability for hydrogen ions. It is suggested that these phenomena be studied as a possible means of decreasing energy consumption related to transport. Figures 3, references 71: 24 Russian, 47 Western.

[1627-6508]

ECOLOGY

UDC 577.472(26)

ROLE OF INFUSORIA WANDERERS OF CENOSIS OF GROWTHS IN PLANKTON AND FEATURES OF THEIR ECOLOGY

Moscow IZVESTIY AKADEMII NAUK SSSR; SERIYA BIOLOGICHESKAYA in Russian No. 6, Nov-Dec 84 (manuscript received 20 May 82) pp 880-886

BRAYKO, V.D. and DALEKAYA, L.B., Institute of Biology of the Southern Seas, UkrSSR Academy of Sciences, Sevastopol

[Abstract] Study of the role of wanderers in plankton in 1979-1981 included observation of population dynamics of infusoria in growths on glass plates exposed in Sevastopol Bay and sample taking of microzooplankton 3-10 times a month from June 1981-May 1982 showed that infusoria wanderers play a significant role in the productivity of littoral regions of the bay. The species *Zoothamnium alternans*, *Z. sp.*; *Ephelota crustaceorum*; *Vorticella campanula*; *V. globularia*, *V. sp.*; *Acuneta grandis*, *A. sp.* and *Podophrya* were identified in the plankton. Infusoria were found in wanderers in greater or lesser numbers throughout the year; optimum temperature range for their multiplication was very wide at 6.2°-23°. Rate of division of infusoria of genera *Vorticella*, *Zoothamnium*, *Acineta* and *Ephelota* at 14°-18° was 5.6, 4.6, 3.4 and 3.2 times per day respectively. Wanderers of these species were found in the plankton from 30 minutes up to 48 hours. Use of them as food for young fish and invertebrates in mariculture was recommended. References 11: 8 Russian, 3 Western.

[1682-2791]

ENVIRONMENT

ACADEMY PRESIDENT SADYKOV ON ENVIRONMENT, WATER

Tashkent OZBEKISTON ADABIYOTIVA SAN"ATI in Uzbek 1 Jun 84 p 2

[Editorial Report] Tashkent OZBEKISTON ADABIYOTI VA SAN"ATI in Uzbek 1 June 1984 carries on page 2 a 1,600-word interview with Academician Obid Sodiqov, President of the UzSSR Academy of Sciences and Chairman of its Scientific Council on Biospheric Problems, titled "One Blow Has Ten Poisons." In response to a question on what steps are being taken to preserve air and water resources Sodiqov discusses some factors contributing to pollution. Thousands of chemical plants worldwide release various gases into the atmosphere producing negative changes in the ozone layer and resulting in an accumulation of carbon dioxide gases. Excessive chemicalization of agricultural processes also has destructive effects on the environment. Finally, some experts attribute 60 percent of urban pollution to automobile emissions. Faced with these problems, some bourgeois ideologs bandy terms like "ecological crisis" and call for a halt to scientific and technological development and for a return to the past. Others place their hope in technology as though it were a god that could solve the problem all by itself. The worst type attribute crises of natural, food, and energy resources to population growth. Soviet scholars, supported by doctrines of Marxism-Leninism, propose to utilize natural resources without harming the environment. Numerous republic institutes conduct research on ways to efficiently utilize resources without creating pollution. They work in substantive areas such as the use of productive, although nontraditional substances for plant protection, filtering wastes produced by industrial enterprises and converting them to other uses, protecting soil resources, setting up plant and animal preserves, and protecting geological conditions in steppe and semi-steppe areas. An example of a practical measure in this field is the formation of 77 auto emissions inspection stations in Tashkent City, whose work has made it possible to cut such harmful emissions by a factor of 3 to 4.

Asked how the Scientific Council on Biospheric Problems views the problem of installing equipment to clean up wastes from chemical plants, Sodiqov replies that scientific research on such equipment is not well established in the republic. Indeed, the "Neogaz" Scientific Research Institute is the only institute in the Soviet Union working on this problem. Moreover, the "Navoiazot" Plant in Navoi, the "Elektrokhimprom" Plant in Chirchik, and mineral fertilizer plants in Samarkand, Kokand, and other cities, are subordinate to union ministries and are not always responsive to local

supervisory organizations. Nor do they adequately use the substantial sums allocated to them annually for purposes of environmental protection. Another aspect to this problem is that Uzbekistan lacks a scientific institute specializing in methods of cleaning up industrial pollutants. Still, the scholars at the Chemistry Institute of the republic Academy of Sciences have done some work in this field. Several years ago they designed methods for producing cement and other construction materials from the phosphorus waste of Almalyk Chemical Plant. They also produced the technology for extracting nitrogen fertilizer from sulphur nitrate ammonia wastes of the Chirchik Metallurgy Combine. During 1978-1984 the combine produced 20,000 tons of fertilizer from these wastes.

Asked to comment on the ecological harm that accompanies the benefits of land reclamation, Sodiqov quotes Engels to the effect that nature exacts revenge on man for every victory he gains over her. He states that the primary problem in Central Asia is the efficient use and protection of water resources. According to recent calculations all of the water in the Syrdarya and Amudarya River will be drawn off for agricultural uses by the year 2005. Newly reclaimed lands require fresh water, chemical pesticides and herbicides, and mineral fertilizers. The Karshi and Dzhizak Steppes that are currently being reclaimed contain salt which must be rinsed from them. This process leads to an increase in the salt content of fresh water sources. Another important problem in the preservation of water resources is the increasing mineralization of fresh water.

CSO: 1840/184

BRIEFS

ENVIRONMENT AND HEREDITY--(Azerbaijan Information Service)--With the increase in levels of toxic substances in the environment, there is increase in risk of higher incidence not only of genetic and other specific diseases, but also cardiovascular and neurological diseases. It is all the more urgent to prevent them, and one of the promising directions in this field is the use of biologically active substances of plant origin as protective agents for people. The problem of using the flora of Azerbaijan for this purpose is being explored at the Institute of Botany of the Azerbaijan Academy of Sciences. It is the chief organization for one of the sections of the joint research program of CEMA member nations, and its director, Urkhan Alekperov, corresponding member of the Azerbaijan Academy of Sciences, represents our country in the team of experts of the International Commission for Protection of the Environment Against Mutagens and Carcinogens. At present, Nauka Publishing House in Moscow has released the book, "Antimutagenesis. Theoretical and Practical Aspects," by this Azerbaijan scientist. It summarizes the results of many years of research conducted at the institute, discloses original methods of protecting the human genetic system against attack by man's polluted environment. The book also reports the results of research conducted jointly with physicians, which demonstrate the possibility of using biologically active agents and lists data on the distribution of such agents in cereal crops, cotoneaster and other plants growing in Azerbaijan. [Text] [Baku BAKINSKIY RABOCHIY in Russian 1 Nov 84 p 3] 10,657

CSO: 1840/121

UDC: 614.777-07

COST ESTIMATE OF STUDIES OF HYGIENIC STANDARDIZATION OF CHEMICAL SUBSTANCES  
IN WATER

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received  
3 May 84) pp 47-49

KRASOVSKIY, G.N., SHAFIROV, B.M. and ZHOLDAKOVA, Z.I., Scientific Research  
Institute of General and Communal Hygiene imeni A.N. Sysin, USSR Academy of  
Medical Sciences; Scientific Research Institute of Organic Intermediates and  
Dyes, Moscow

[Abstract] Studies have shown great variation in the cost, amount of labor  
and time consumed in studies intended to establish the maximum permissible  
concentration of substances in the environment and at the workplace. This  
article represents an attempt to develop a single approach to estimation of  
the cost of studies required to develop hygienic standards for the water in  
reservoirs and preparation of methodologic recommendations related to this  
problem. The work which must be performed to develop an MPC was divided into  
sixteen independent fragments encompassing the research tasks per se as well  
as general tasks such as administration of research, processing and printing  
of results. A table lists the research fragments and standard cost factors,  
while a second table lists the stages which should be performed and total costs  
to be expected for five levels of detail which may be utilized in studies  
leading to the development of MPC.

[118-6508]

UDC 614.777-07

METHODICAL APPROACH TO DEVELOPMENT OF HYGIENE PREDICTION OF STATE OF AIR QUALITY IN REGIONS NEAR LARGE PETROCHEMICAL COMPLEXES

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 84 (manuscript received 6 Jun 84) pp 43-47

PRUSAKOV, V.M. and MOISEYEV, G.Ye., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Development of a model of hygienic prediction of air quality is described and discussed. A block diagram of the model for use in regions in which are located large petrochemical complexes is presented in the text. The main goals of hygienic prediction included: what will happen if existing trends of development of the national economy and air quality measures continue without modification; what specific measures must be taken to improve air quality and eliminate pollution and what direction should executive and control organizations take to obtain air quality desired. It was recommended that the model be used with existing methods of statistics, extrapolation, expert assessment and modelling to achieve goals sought for in hygienic prognostication. Use of the model to predict air quality in the future presented an unfavorable picture. Figure 1; references 6 (Russian).

[1683-2791]

UDC 614.71-07

SOME METHODICAL APPROACHES TO STUDY OF EFFECT OF ENVIRONMENTAL FACTORS ON PUBLIC HEALTH IN ZONE OF TERRITORIAL-INDUSTRIAL COMPLEX (CARPATHIAN REGION AS EXAMPLE)

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 84 (manuscript received 10 Apr 84) pp 24-27

BEZKOPYL'NYY, I.N., L'vov Scientific Research Institute of Epidemiology and Microbiology

[Abstract] Aspects of a methodological approach used during study of the effect of hazardous environmental factors on the health of persons living in the area near a territorial-industrial complex with enterprises located in several parts of the area are described and discussed. Calculations were used to assess the role of industrial enterprises in creating the overall air quality of populated points in the area of such territorial-industrial complexes. Use of the methodological methods made it possible to determine, for the first time, the quantitative dependence of various public health indicators (morbidity levels, health indicators of preschool children, frequency of intensification of chronic diseases and deterioration of sanitary-domestic conditions) on the degree of pronouncement of environmental factors during their combined effect in a specific region. These findings provided

a basis for recommendations concerning environmental protection from the effects of emissions from petroleum territorial-production complexes.  
References 12 (Russian).

[1683-2791]

UDC 614.7(47+57)

#### CURRENT APPROACHES TO SOLUTION OF HYGIENIC PROBLEMS OF ENVIRONMENTAL PROTECTION

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 84 (manuscript received 11 Jun 84) pp 4-7

SHITSKOVA, A.P., GIL'DENSKIOL'D, R.S. and VINOKUR, I.L., Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman

[Abstract] A complex, systematic and integrated approach to nature protection, developed to prevent environmental pollution and degradation while making optimum use of natural resources and, first and foremost, safeguarding human health, is described and discussed. Sanitary districting of regions of territorial-industrial complexes being considered, weighting of problem situations in these regions and application of a complex approach to implementation of sanitation measures were recommended to assure environmental quality. Assessment of environmental and production factors of areas considered was based on chemical, physiological, biochemical, cybernetic and other methods of study. Study of territorial-industrial complexes in Siberia revealed specific environmental hazards there which might affect future industrial development of the area. Recommendations for improving environmental quality in regions of the Baykal-Amur Railroad and the Kuybyshev Automobile and Tractor Electrical Equipment and Carburetor Plant were discussed and recommendations for improvement were presented. References: 7 Russian.

[1683-2791]

UDC: 614.777-07

#### CALCULATION METHODS OF PREDICTING SAFE CONCENTRATIONS OF HARMFUL SUBSTANCES IN RESERVOIRS

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 14 Apr 84) pp 17-20

NOVIKOV, S.M., First Moscow Medical Institute imeni I.M. Sechenov

[Abstract] A study was made of the relationship between the parameters of toxicity, MPC in the air of the workplace, mean round-the-clock MPC in the air and MSC for oral administration of a broad sampling of harmful substances, and the accuracy of calculations using various equations was analyzed. It was found that the strength of the relationship between MSC and MPC in the

air at the workplace, the atmosphere and mean fatal doses is not great. For 95% of substances the divergence between the actual and predicted maximum safe concentration is 100-150 times. Calculation equations which utilize the mean fatal concentration are still less accurate. A regression analysis of two groups of harmful substances, standardized using different harmfulness criteria, was undertaken to estimate possible errors in prediction of the MSC. The use of calculation equations obtained by analyzing an entire group of substances may lead to serious underestimation of possible toxic properties of new compounds. Consideration of the confidence boundaries of prediction of the MSC practically eliminates the possibility of failing to recognize compounds which are harmful. Regression equations are recommended for use in the system of methods of establishing MPC of harmful substances in the water of reservoirs. References 9 Russian.

[118-6508]

EPIDEMIOLOGY

VIRAL HEPATITIS ON THE RISE

Tbilisi KOMUNISTI in Georgian 8 Aug 84 p 4

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 8 August 1984 page 4 carries an 1100-word article by Prof Eter Botsvadze, head of the Medical Institute's Contagious Diseases Department, concerning the rising incidence of viral hepatitis in Georgia the past 5 to 6 years. In 1982, for example, more hepatitis patients were admitted to the republic's Clinical Hospital for Contagious Diseases than patients suffering from influenza, salmonellosis, dysentery, and meningitis. Professor Botsvadze's department has been working on all aspects of the disease (both A and B types) for over 20 years, and has developed several laboratory and therapeutic techniques that have won world acclaim; some of them are described here.

Botsvadze then turns to discussion of the disease's insidious nature, in particular the apparent absence of symptoms and long-range "residual effects," and the absolute necessity of thorough "dispensarization" and observation. Since the polyclinic network is unequipped to provide these services, since February 1984 the Contagious Diseases Hospital has provided a viral hepatitis consultation and dispensarization office.

In the future, joint efforts will be conducted in collaboration with the Medical Institute's Epidemiology Department to make a broad study of hepatitis virus carriers in the "healthy population," among blood donors, and certain types of medical personnel. This is because figures have shown that in other republics, some 10 to 22 percent of such personnel are carriers, and the incidence of infection among Georgia's medical personnel has been rising.

CSO: 1840/184

UDC: 616.98:579.843.95]-036.2

#### ENDEMIC SITES FOR TULAREMIA ALONG IRTYSH-KARAGANDA CANAL

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 10, Oct 84 (manuscript received 7 May 83) pp 102-104

[Article by A. N. Tursunov, O. A. Baytanayev, V. I. Stogov, I. G. Prygunova, O. B. Chimirov, M. A. Chepelyuk, N. A. Amirova and V. I. Pakizh, Central Asian Scientific Research Institute of Plague Control, Alma-Ata and Pavlodar Oblast Sanitary and Epidemiological Station, Pavlodar]

[Text] Anthropogenic activities have a significant influence on the endemic sites of many zoonotic infections, including tularemia, causing them to regress in some cases and become activated in others.

Such a significant hydraulic engineering installation as the Irtysh-Karaganda Canal, which is about 500 km long, was started up in 1971. It bisects from north to south the eastern half of the low, rounded, isolated hill area of Kazakhstan and serves as the source of water for Central Kazakhstan.

Our objective here was to investigate the biogeocenosis formed along the route of the Irtysh-Karaganda Canal in order to detect *Francisella tularensis* in it.

#### Material and Methods

An epizootiological inspection for tularemia was made using conventional method [3] in 1971-1982. In all, there were 53,250 trap-days to keep records of and catch animals with Gero pressure-type and other traps. A total of 4609 mammals were trapped for bacteriological examination: 1506 water rats, 1370 common field mice, 1093 narrow-skulled voles, as well as 640 specimens of other species. We gathered 15,138 ectoparasites (fleas, Ixodes ticks and gamasid mites). A total of 823 biological tests were performed on white mice. We gathered 928 pellets of undigested food residue from predatory birds, which were tested in the antibody neutralization reaction (ANR) for demonstration of specific antigen [2]. It should be noted that, on the whole, the material was collected in a zone of strict sanitation of the canal (200 m to either side of its main stream). This work was done under the supervision of Prof M. A. Aykimbayev.

#### Results and Discussion

Analysis of ecological and landform distinctions of the route of the Irtysh-Karaganda canal enables us to distinguish four types of anthropogenic biotopes:

first, near the water, including the shoreline of drainage reservoirs, hydraulic power systems and portions of the Shiderty River floodplain (this type is characterized by reed and cat-tail plants); the second refers to the forest strips along the canal route (where poplar, maple and oleaster trees have been planted); the third consists of steppe-like areas adjacent to the canal represented by fescue and feather grass-covered steppe; the fourth type consists of the hydraulic power system dams, irrigation dikes and dumped soil, overgrown with mixed cereal and wormwood grasses.

Results of serological ANR test on pellets gathered along the Irtysh-Karaganda Canal

Site of collection	Collected pellets		Geometric mean of titer
	total	positive	
Installation 101	128	3	1:52
Ekibastuz backup reservoir	84	7	1:48
Pumping station 5	91	-	
Hydrosystem 1	82	-	
8 km south of Shiderty village	93	1	1:20
Hydrosystem 2	78	-	
Hydrosystem 3	63	-	
Hydrosystem 5	117	5	1:48
Pumping station 11	20	-	
Pumping station 13	124	-	
Hydrosystem 10	48	-	
Totals	928	16	

We registered 25 species of mammals, the background species being the water rat (32.7% of the catch), forest mouse (29.7%) and narrow-skulled vole (21.9%). The Arctic shrew, striped hairy-footed and Eversmann's hamsters, root vole, steppe pika [mouse hare] and other species were found in small numbers [1]. The average number of background species constituted 9 specimens per 100 traps. Maximum indicators of their number constituted 80% trapped.

Only one species of Ixodes ticks was recorded, *Dermacentor marginatus* Sul. The index of its larvae and nymphs on the animals ranged on the average from 0.9 to 3.2, while incidence constituted 29.4-69.2%. Among the gamasid mites (total of 23 species), there was prevalence of *Laelaps muris* Ljn, *Haemolaelaps glasgowi* Ew. and *Hirstionyssus isabellinus* Oud. (81.0% in the collections). Of the 28 flea species found, there was prevalence of *Ceratophyllus penicilliger* Gr. (26.2%), *C. breviusculus* W. (18.0%) and *Frontopsylla elata popovi* Lebed. (14.4%). The other species were found in small quantities.

According to the results of serological testing of pellets, it was proven already in 1978 that there could be a tularemia site in the zone of the canal in question [4]. In subsequent years, the number of sites where pellets were found, the contents of which demonstrated the antigen of the pathogen of tularemia, increased to four (see Table).

*F. tularensis* was isolated on 15 October 1981 from a white mouse that had been infected subcutaneously with a suspension of the liver from an Arctic shrew caught in the vicinity of the village of Shiderty in Pavlodar Oblast. The location where this animal was trapped was a segment of the floodplain of Shiderty River connected to the canal. This section is covered with black *Artemisia*, and is inhabited by the forest mouse, harvest mouse, as well as water rat, along with the Arctic shrew. It should be added that this is the first time that we have seen spontaneous *F. tularensis* infection in the Arctic shrew in Kazakhstan. The isolated strain was found to be typical in its basic biological properties and referable to the holarctic race.

In conclusion, it must be stressed that, at the present time, the route of the Irtysh-Karaganda canal is inhabited by many species of small mammals, among which circulation of the pathogen of tularemia has been found. And, since the water factor plays a large part in epidemiology of tularemia, one should intensify steps to prevent this disease in the area of the canal in question.

#### Conclusions

1. A biogeocenosis has been formed along the Irtysh-Karaganda Canal, that has been penetrated by the pathogen of tularemia. This is indicated by the presence of specific antigen in pellets and an instance of isolating a strain from the Arctic shrew.
2. One should intensify preventive measures against possible epidemic complications in the region of this hydraulic engineering installation.

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10,657  
CSO: 1840/1609

UDC 576.895.42:599.9

SITES OF ATTACHING OF TAIGA TICK (*IXODES PERSULCATUS*, IXODIDAE) ON CHILDREN AND ADULTS

Leningrad PARAZITOLOGIYA in Russian Vol 18, No 5, Sep-Oct 84 (manuscript received 10 Feb 84) pp 383-392

ROZENBERG, A.I., Republic Sanitation-Epidemiologic Station of Karelian ASSR, Petrozavodsk

[Abstract] Topography of the attachment of Taiga tick to children and adults shows similarities and differences. Among the similarities one finds a high level of tick fixation in armpits, on the neck, on frontal body sites and lower extent on the limbs. Tick fixations characteristic for the children group include the area of the head, primarily the face and the ear area, along with a sharp increase in the fixation along the armpits, which is age related. Among adults, the ticks adhere primarily to the back of the upper torso. These characteristics are related to the extent of outdoor activity, to ecological characteristics, to the clothing worn during exposure time, to differences in body size of the subjects and to climatic conditions. These topological findings should be used to improve the effectiveness of prophylactic measures against tick encephalitis (the order of the examination of a body when searching for ticks and the use of deodorants). Figures 2; references 31: 30 Russian, (1 by Western author), 1 Western.

[1677-7813]

UDC 576.895.77.01 + 576.895.77.095.1

FAUNA AND DISTRIBUTION OF BLOOD-SUCKING MOSQUITOES OF *CULEX* L. GENUS (DIPTERA, CULICIDAE) IN UKRAINE

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 3, May-Jun 84 (manuscript received 10 Dec 82) pp 61-66

SHEVCHENKO, A.K. and POPOVICH, A. P., Zaporozhye Medical Institute

[Abstract] *Culex* L. mosquitoes are widely spread throughout the Ukraine; in some locations their numbers are quite significant and yet these pests have

not been studied adequately. In this paper, on the basis of their own and literature data the authors attempted to define the fauna and the distribution of these mosquitoes. Currently there are the following species found over most of the Ukrainian territory: Cx. pipiens, Cx. modestus and Cx. territans. The other species: Cx. hortensis, Cx. martinii, Cx. mimeticus and Cx. molestus are found primarily in Crimea and in the continental steppe and forest steppe zones. Cx. theileri and Cx. torrentium are found only in the Central Polesye forest zone. Figures 4; references 41 (Russian). [1674-7813]

UDC 613.68:628.31

HYGIENIC ASSESSMENT OF OPERATING MARINE INSTALLATIONS FOR PURIFYING AND DECONTAMINATING SEWAGE ABOARD SHIPS

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 84 (manuscript received 18 May 84) pp 18-21

SIDENKO, V.P., YAROTSKAYA, N.Ye., PARFENOVA, I.V., KASHINA, T.I., MAKSIMOV, A.B. and MORDVINOVA, D.I., Branch of Scientific Research Institute of Hygiene of Water Transport, USSR Ministry of Health, Odessa

[Abstract] Sanitation and hygienic assessment of processes of cleaning and decontaminating ships' sewage by use of imported apparatus is described and discussed with consideration of requirements of the USSR Ministry of Health concerning such matters. Sewage treatment apparatus used on ships of the Black Sea Marine Shipping Line including LX (Peoples' Republic of Poland), Trident (Great Britain), Termobiomak (Scotland) and Khamann (West Germany) apparatus were studied. Effectiveness of the apparatus was assessed by chemical, bacteriological and virological methods with study of 93 samples of ships' sewage. Study of 68 eluates revealed various viruses in 8 (12 percent) with Coxsackie B-3 predominating and with polio virus serotype 1 and adenovirus being isolated. Three strains of enteroviruses were isolated from ships' effluents before their purification and five were isolated after purification of LK, Termobiomak and Trident apparatus. Sewage from one of the ships contained enterovirus Coxsackie B-3 before and after purification and decontamination by Trident apparatus. In addition to untreated sewage being assessed as epidemiologically hazardous, sewage treated with use of LK, Termobiomak and Trident apparatus contained enteroviruses in 11+0.1, 10+0.17 and 6+0.07 percent of the samples respectively which confirmed the unsatisfactory situation in regard to sewage treatment aboard these ships. [1683-2791]

UDC 576.895.42.095.38:599.323.4

AUTOLABELLING OF GAMASID MITES AND FLEAS IN NESTS OF RED VOLES IN WINTER  
(ACCORDING TO RADIOISOTOPE LABELLING DATA)

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4,  
Jul-Aug 84 (manuscript received 28 Dec 82) pp 63-67

AL'BOV, S.A., LAVRENCHENKO, L.A., and NIKOLAYEVA, G.A., Scientific Research Institute of Experimental Medicine imeni N.F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Data concerning trophic associations between gamasid mites and fleas in cohabitation with red voles in nests in winter were presented and discussed. Red voles (*Cl. glareolus*) were trapped, labelled with radioactive cobalt and radioactive glycine, released and traced with the aid of radiometers. *H. nidi* and *C. penicilliger* were found to be the most numerous among the mites and fleas in the winter nests of the voles and were the most actively feeding species. *H. nidi* and *C. penicilliger* numbers increased with the increase of time of use of the nests by the voles and had little relationship to the abundance of these species in the nests. Other species found in the nests did not feed on the voles to any great extent. It was assumed that the connection between the gamasid mites, fleas and voles was topical rather than trophic. Figures 4; references 11 Russian.

[1675-2791]

UDC 614.449.57:576.895.771:614.449.932.34:615.285.7

ASSESSMENT OF EFFECTIVENESS OF HAND DUSTING OF GREAT GERBIL BURROWS IN CONTROLLING BURROW SANDFLIES (PHLEBOTOMINAE)

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4,  
Jul-Aug 84 (manuscript received 16 Feb 84) pp 41-46

ZHERIKHINA, I.I., DERGACHEVA, T.I. and KRUGLOV, D.B., Institute of Medical Parasitology and Tropical Malaria imeni Ye.I. Martsinovskiy, USSR Ministry of Health; Scientific Research Institute of Medical Parasitology imeni L.M. Isayev, Samarkand

[Abstract] Field experiments were carried out in Mubarek Rayon of Kashkadarya Oblast in the UzSSR to assess the effect of manual dusting of large gerbil burrows with 12 percent hexachlorocyclohexane dust to control burrow sandflies of the genus *Phlebotomus*. Experiments were carried out on colonies with different initial numbers of sandflies. One dusting of burrows with an average number of sandflies caused a brief (5-10 days) reduction of sandfly populations while the same treatment had no appreciable effect on burrows with greater initial sandfly populations. Two-fold dusting reduced sandfly populations of the subgenus *Paraphlebotomus* 4-fold as compared to the control level but was ineffective against the basic epidemiological dangerous carrier

of zoonotic cutaneous leishmaniasis, Ph. papatasii. Hand dusting in natural foci of zoonotic cutaneous leishmaniasis was found to be inadvisable because of the labor intensiveness and relative ineffectiveness of such operations. Figures 2; references 16: 13 Russian, 3 Western.  
[1675-2791]

UDC 576.895.42.095.38(235.233.)

RELATIONSHIP OF FEEDING LEVELS OF IXODES PERSULCATUS P. SCH. LARVAE AND NYMPHS TO NUMBER OF SMALL MAMMALS IN FORESTS OF WEST SAYAN

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 84 (manuscript received 24 Mar 83) pp 58-62

LABZIN, V.V. and NAUMOV, R.L., Institute of Medical Parasitology and Tropical Malaria imeni Ye.I. Martsinovskiy, USSR Ministry of Health, Moscow

[Abstract] Results of long-term (1965-1981) studies of interaction of populations of taiga ticks *Ixodes persulcatus* P. Sch. in preimagal phases and their small mammal hosts in Western Sayan were presented and discussed. Different variants of interaction of taiga tick populations in the preimagal phases and the hosts were found even in this small area. It was assumed that the abundance of small mammals cannot be used effectively to predict the number of ticks in the area. The mammal population can be used for this purpose only when a clear-cut and permanent relationship is established between the feeding level of immature ticks and the abundance of beasts. Figure 1; references 20: 19 Russian, 1 Western.

[1675-2791]

UDC 578.833.26:578.286]:591.69

EXPERIMENTAL STUDY OF INTERACTIONS BETWEEN VERTEBRATES AND TICK-BORNE ENCEPHALITIS VIRUS. REPORT 3. BIRDS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 84 (manuscript received 25 Nov 83) pp 74-77

NAUMOV, R.L., GUTOVA, V.P. and CHUNIKHIN, S.P., Institute of Medical Parasitology imeni Ye.I. Martsinovskiy, Ussr Ministry of Health; Institute of Poliomyelitis and Virus Encephalites, USSR Academy of Medical Sciences, Moscow

[Abstract] A survey of the literature supported the conclusion that most birds cannot serve as donors of tick-borne encephalitis virus for taiga tick larvae and nymphs because of non-susceptibility of birds to the virus or because of low titers of viremia, insufficient for infection of ticks and transmission of the pathogen during their development. Subthreshold titers

of virusemia have been found in coots and domestic ducks, but these fowl cannot be tick-borne encephalitis virus donors because ticks do not feed on them. The role of birds in epizootiology of tick-borne encephalitis can be determined only by studying the kinetics of virusemia for a long enough time after subcutaneous injection of doses near to natural doses. It was suggested that there may be "ornithophile" strains of tick-borne encephalitis virus. A table shows results of subcutaneous infection of 21 species of birds by tick-borne encephalitis virus. References 28: 16 Russian, 12 Western. [1675-2791]

UDC 616.9-036.21(479.22)

#### IMPORTANCE OF THEORY OF NATURAL FOCALITY IN PRESENCE OF PARASITIC AND INFECTIOUS DISEASES IN GEORGIA

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 84 (manuscript received 10 Nov 83) pp 34-36

MARUASHVILI, G.M., Scientific Research Institute of Medical Parasitology and Tropical Malaria imeni S.S. Virsaladze, Georgian SSR Ministry of Health

[Abstract] The importance of Ye. M. Pavlovskiy's theory of natural focality in deciphering epizootiology and epidemiology of some zoonotic parasitoses and bacterial diseases in development of sound prophylactic measures against such diseases in the GSSR was discussed. Natural focality in the GSSR has been established for visceral leishmaniasis and cutaneous leishmaniasis, Caucasian tick-borne relapsing fever, trichinellosis, brucellosis, non-jaundice leptospirosis and ornithosis. The epidemiological chain of these diseases was discussed and natural carriers for each in the GSSR was listed. The role of natural focality in the incidence of brucellosis was not especially noticeable during high levels of endemic and enzootic brucellosis but appeared after marked reduction or near elimination of synantrophic foci of brucellosis when morbidity rose rapidly and affected healthy animal husbandry farms without importation of cattle from other places. Total elimination of these diseases in the GSSR was considered to be impossible because of this natural focality. References 23 (Russian). [1675-2791]

MALARIA AND ITS VECTORS, PREVENTIVE AND CONTROL MEASURES IN KIRGHIZIA

Frunze ZDRAVOOKHRANYENIYE KIRGIZII in Russian No 5, Sep-Oct 84 pp 11-17

PLISHKIN, I.A. and AYMANBETOV, M.A., Kirghiz State Medical Institute

[Abstract] A study was performed between 1970 and 1981 to determine the species composition of mosquitoes in Kirghizia, the population and percent ratio of various mosquito larvae species in various bodies of water and to recommend specific mosquito control measures. All of the areas in Kirghizia where conditions are good for habitation by humans have mosquito problems, with large numbers of aggressive mosquitoes present. However, people living in high mountain valleys are not threatened by malaria, since the genus Anopheles does not live there. The following steps are recommended to reduce the threat of malaria: reduce access to stagnant water in low relief areas; drainage in areas with ground water on the surface; straightening and deepening of stream beds and construction of dams to eliminate shallows; creation of single channels for water runoff; integration of land reclamation and mosquito control efforts; annual investigation of presence of mosquito larvae in bodies of water; watch for anopheles mosquitoes in populated areas where malaria might be brought in; study of species composition of mosquitoes in every form; strict monitoring of rice fields; production of seasonal development charts for all mosquito species for each region of the Republic; organized collection of mosquito specimens for comparative determination of species. Extermination should be performed in two stages, including treatment with poison from the 1st to the 25th of April in the plains, 20 April through 15 May in mountain valleys, 15 May through 1 June in high mountain valleys, and treatment in all valleys of Tyan-Shan beginning 15-25 June and continuing through 5-15 July.

[1022-6508]

BIOLOGICAL CHARACTERISTICS OF BRUCELLAE ISOLATED IN KIRGHIZ SSR

Frunze ZDRAVOOKHRANYENIYE KIRGIZII in Russian No 5, Sep-Oct 84 pp 18-19

UZBEKOVA, B.R., BEKETOV, B.I., KHODZHAYEVA, L.U., GLINENKO, V.M., AKMATOV, K.A., ARKHPOVA, V.V. and MAKAROV, A.M., Alma-Ata, Frunze, Osh, Przheval'sk

[Abstract] Some 342 strains of brucellae isolated from diseased persons between 1977 and 1981 were studied in order to determine the biological characteristics of brucellae in Kirghizia. Cultures were studied immediately upon arrival at the laboratory by the method suggested by the FAO/WHO International Subcommittee on Taxonomy of Brucellae. Differentiation of 336 cultures indicated that 98.8% (332) were Br. melitensis, 114 strains of biotype 1, 212 of biotype III. Only six strains of biotype II were found. Four cultures, or 1.2%, were Br. abortus. Of 342 strains studied, 334 produced bacteriocins capable of regarding the growth of an indicator strain. All cultures were found to be highly virulent for guinea pigs.

[1022-6508]

FOOD TECHNOLOGY

BRIEFS

BARENTS KELP FARMING UPDATE--Scientists at the Murmansk Institute of Marine Biology, Kola Affiliate of the USSR Academy of Sciences, are preparing to harvest kelp from the first experimental-production Laminaria plantation in the Barents Sea. The plantation for artificial farming of Laminaria was started 1 year ago in the Dalnezelentskaya Inlet of the Barents Sea. The institute's staff sowed kelp spores on capron lines, which are held afloat at a specified depth by means of special glass floats. At present, there are 200 to 300 valuable seaweed plants up to 1.5 m long per 5-m section of the capron lines. It has been estimated that 70 to 100 tons of laminaria mass will be recovered per hectare of plantation. "With each year, the requirements of the national economy and, primarily, medicine are growing with respect to alginates and mannitol that are processed from marine Laminaria seaweeds," stated V. Makarov, laboratory chief at the Institute of Marine Biology. "However, there are limited possibilities of harvesting them from naturally occurring plantations. Moreover, mechanized harvesting deprives valuable fish species of spawning and feeding places. Planting the seaweeds on capron lines simplifies their recovery." [By A. Khramtsov (PRAVDA stringer, Murmansk] [Text] [Moscow PRAVDA in Russian 11 Nov 84 p 6] 10,657

CSO: 1840/121

30-177-1

## IMPROVED USE OF FISH RESOURCES

Alma Ata PARTIYNAYA ZHIZN' KAZAKHSTANA in Russian 9 Sep 84 pp 91-92

TAIROV, M., chief, Kazakhrybpromsbyt

[Abstract] Fish resources are very important for the state food program of the USSR, fish consumption for 1985 being planned as 18.6 kg per person, or 25% of the total necessary protein. This article discusses problems related to meeting this goal. Fish catches have decreased in the continental USSR. The composition of fish caught by species in the ocean has altered. The author's fish production association has undertaken redesign of fish processing capacity to respond to the change from large ocean fish to the smaller species now increasing as a percentage of the total catch. Many stores where fish are sold do not have freezers cold enough to keep the fish fresh in the frozen state. Unfortunately, in the past 8 years, the USSR Fishing Industry Ministry has not allocated capital funds for the construction of new cooling equipment for the author's organization. At present, fish are carried by rail only in 5 and 10-car sections. Delivery of fish products by individual refrigerated cars is also needed. Loading and unloading operations involved in the transport of fish should also be mechanized.

[130-6508]

GENETICS

CELL COMPONENT PREPARATIONS FOR GENETICS RESEARCH

Riga SOVETSKAYA LATVIYA in Russian 13 Jan 85 p 2

[Text] A new class of biochemical preparations -- components of living cells which take part in synthesizing proteins -- has been introduced into production during the 11th Five-Year Plan at the "Biolar" Research and Production Association. These preparations were developed for the USSR Academy of Sciences and are intended for investigation of the mechanism of transmission of genetic information. The process of the reading of genetic information in cells is under study in scientific laboratories of the Soviet Union, as well as in many other countries. This process determines the biosynthesis of hundreds and thousands of molecules which are the 'building material' of living organisms.

(A photograph shows Marite Korsaka, senior engineer of the association's laboratory of preparations for molecular biology, preparing chromatograph columns for operation.)

FTD/SNAP  
CSO: 1840/200

UDC: 615.285.7-015.44.07

CYTOGENETIC ACTIVITY OF COMBINED USE OF HERBICIDES 2,4-D AND 2,4,5-T

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 26 Jan 84) pp 28-29

KONSTANTINOVA, T.K. and SHEVELO, F.S., Saratov Medical Institute

[Abstract] A study was made of the cytogenetic effect of combined exposure to chlorophenoxy derivatives -- butyl esters 2,4-D and 2,4,5-T (2,4-DB and 2,4,5-TB) in near-threshold doses when administered individually or when both are present in the environment. White rats in five groups were tested. It was found that the combination of 2,4-DB and 2,4,5-TB at 0.5 and 0.05 mg/kg yielded a greater cytogenetic effect than separate administration of the preparations, indicating that they potentiate each other. The cytogenetic effect of the combination of preparations was selective and specific at low doses. 2,4,5-TB was found to play the leading role in development of the pathologic process. The herbicides and their combinations have a mutagenic effect.

References 9 Russian.

[118-6508]

BOOK: GENOME VARIABILITY

Moscow PRIRODA in Russian No 10, Oct 84 pp 121-123

KISELEV, L.L., doctor of biological sciences, Moscow, reviewer

[Abstract] This is a review of the book by KHESIN, R.B.: NEPOSTOYANSTVO GENOMA [Variability of the Genome], Moscow, Nauka, 1984, 472 pp. Khesin's book is said to represent an outstanding contribution to modern genetics, with special emphasis on the transposable elements and their significance. The book is well written, contains more than 4500 references, and more than 150 tables and figures. Khesin feels that the global biota is represented by a single genome, with viruses and plasmids functioning in the transfer of genetic elements among the various components of the biota. This form of transfer, as well as the existence of the transposable elements, constitutes the fundamental cornerstone of evolution and variability. The book is

described as one of the most significant publications in Soviet biological thought, and unfortunately only 2250 copies were printed.

[199-12172]

UDC: 575.224.234:633.1<<321:324>>

#### ANALYSIS OF OCTOPLOID TRITICALE GENOME BY ENZYME MARKER METHOD

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 28, No 11, Nov 84 (manuscript received 13 Mar 84) pp 1034-1036

PALILOVA, A.N., KHOTYLEVA, L. V., academician, Belorussian Academy of Sciences, TURBIN, N. V., academician, All-Union Order of Lenin Academy of Agricultural Sciences imeni V. I. Lenin, and YURENKOVA, S. I., Institute of Genetics and Cytology, BSSR Academy of Sciences

[Abstract] A study was made of the isoenzyme composition of esterase and acid phosphatase to describe the functioning of individual components of the octoploid triticale polygenome. The isoesterase spectra of the octoploids studied differed in electrophoretic mobility of fractions. The synthesis of isoenzymes of esterase in the octoploid triticale is found to be determined not by the summary effect of the presence of wheat and rye chromosomes, but rather by a system of complex intergenome interactions in the octoploid genotype. The differences in acid phosphatase and esterase isoenzyme spectra in the cotoploids studied indicate that the functioning of the rye genome in the wheat cytoplasm is manifested to varying degrees. Figures 2, references: 3 Russian.

[1624-6508]

UDC: 575.224.46.044

#### MUTAGENIC ACTIVITY OF DIMETHYLTEREPHTHALATE

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 28, No 11, Nov 84 (manuscript received 16 Dec 83) pp 1041-1044

GONCHAROVA, R. I., KUZHIR, T. D., LEVINA, A. B. and ZABREJKO, S. P., Institute of Genetics and Cytology, Belorussian SSR Academy of Sciences

[Abstract] A commercial specimen of dimethylester of terephthalic acid (dimethylterephthalate or DMT) was studied on a Berlin wild line of *Drosophila melanogaster*. DMT was added to the nutrient medium on which the imagos fed or the flies developed from the stage of egg to imago. The genetic activity of the DMT was evaluated on the basis of its capability to cause dominant lethal mutations (DLM). It was found that though DMT is nontoxic for the imago it does have mutagenic effect, significantly increasing the level of DLM in the egg and subsequent stages of development of the *Drosophila*.

References 8: 3 Russian, 5 Western.

[1624-6508]

UDC: 575.113:576.851.5

MOLECULAR-GENETIC STUDIES OF PROMOTOR REGIONS OF DNA OF BACILLUS THURIN-  
GIENSIS SUBSP. GALLERIAE 69-6. REPORT 1. STRUCTURAL-FUNCTIONAL ANALYSIS

Moscow GENETIKA in Russian Vol 20, No 9, Sep 84 (manuscript received 31 Oct 83)  
pp 1419-1427

TSOY, T.V., SOROKIN, A. V., KRUPENKO, M. A., SEZONOV, G. V., REBENTISH, B. A.,  
SAKANYAN, V. A. and ALIKHANYAN, S. I., All-Union Scientific Research Institute  
of Genetics and Selection of Industrial Microorganisms, Moscow

[Abstract] In order to study the promotor regions of the DNA of *Bacillus thuringiensis*, a library of transcription signals was produced for the *Bacillus*, the producer of an entomopathogenic toxin. This article presents results of continuing structural-functional analysis of the DNA promoter regions. Electron microscope analysis of specific bonding sites of DNA by *E. coli* RNA-polymerase was performed on plasmid DNA. Specific RNA-polymerase bonding sectors are found within the cloned Hind III DNA fragments of the *Bacillus*. Isolated AluI subfragments of *Bacillus* inserts forming specific complexes with RNA polymerase also restore the expression of the promotorless tet gene of the plasmid pCA24 inserted at the Hind III site of the plasmid in the required orientation. Of 3 AluI subfragments of the Hind III fragment of the plasmid pPB29 specifically bonding RNA polymerase, only the 400 base pair fragment restores the expression of the tet gene. Figures 7; references 20: 2 Russian, 18 Western.

[127-6508]

UDC: 575.113:576.851.5

MOLECULAR-GENETIC STUDIES OF PROMOTOR REGIONS OF DNA OF BACILLUS THURINGIENSIS  
SUBSP. GALLERIAE 69-6. REPORT II. ENHANCED GENE EXPRESSION AS A RESULT OF  
INTEGRATION OF IS1-ELEMENT

Moscow GENETIKA in Russian Vol 20, No 9, Sep 84 (manuscript received 31 Oct 83)  
pp 1428-1433

BESKROVNAYA, O. Yu., TSOY, T. V., SAKANYAN, V. A. and ALIKHANYAN, S. I.,  
All-Union Scientific Research Institute of Genetics and Selection of Industrial  
Microorganisms, Moscow

[Abstract] This work utilized the *E. coli* strain K-12HB101,  $r^m$  recA str pro leuB1. The plasmid pPBT9 carrying 1.45 kb *Bacillus* promotor-active fragment was used. Ten clones of *E. coli* containing pPBT9 with resistance to 100  $\mu$ g/ml tetracycline on an agarized medium was selected. To prove the plasmid nature of the mutations, *E. coli* strain HB101 was transformed by plasmids isolated from the mutants. The greatest tetracycline resistance was found in clones transformed by plasmid pPBT9-2, pPBT9-4 and pPBT9::IS1. Determination of the number of copies of the plasmid showed that increasing the level of

expression of the tetracycline resistance gene in plasmid pPBT9-4 is related to mutation related to the number of copies of the plasmids. The mutant plasmid pPBT9::IS1 has triple the level of expression of the tet gene of pPBT9 constructed under control of 1.45 kb promoter containing Hind III fragment of DNA of *Bacillus thuringiensis*. This increase is related to integration of the IS1 element of the *E. coli* gene. Restriction mapping is used to locate the IS1 element integration site in the pPBT9::IS1 plasmid. Figures 5; references 12: 4 Russian, 8 Western.  
[127-6508]

UDC: 575.24:582.264

STUDY OF NATURE OF RESISTANCE IN SINGLE-CELL ALGAE POPULATIONS TO PHYSICAL AND CHEMICAL MUTAGENIC FACTORS

Moscow GENETIKA in Russian Vol. 20, No 9, Sep. 84 (manuscript received 20 Jul 83; in final form 14 Nov 83) pp 1480-1483

SERGEYEVA, S. A., PTITSYNA, S. N., SEMOV, A. B., KHURMATOV, Kh. Kh. and SHEVCHENKO, V. A., Institute of General Genetics imeni N. I. Vavilov, USSR Academy of Sciences, Moscow; Scientific Research Institute for Biological Testing of Chemical Compounds, Moscow Oblast

[Abstract] Laboratory populations of *Chlorella* were exposed to ethylen imine (EI) on a chronic basis and a mutant was extracted resistant to high doses of alkylating mutagens. This article discusses factors providing the maximum resistance to the mutagen. The effectiveness of restoration of single-filament breaks in strains differing in resistance is discussed. Electrophoretic analysis of isoenzymes is used to provide additional information on radioresistant strains. Resistant strains taken from chronically irradiated populations as well as those exposed to EI were found to have highly effective repair systems. Selection of resistant forms with greater effectiveness of restoration of single filament DNA breaks is found to occur in the *Chlorella* populations chronically exposed to mutagenic physical and chemical factors. This does not mean that other protective mechanisms are not present in the *Chlorella* cells, such as activation of endogenous protectors already present, biosynthesis of new protectors, or changes in membrane and cell wall permeability. Figures 4; references 11: 7 Russian, 5 Western.  
[127-6508]

UDC: 575.591

MEDICAL-GENETIC STUDY OF THE POPULATION OF TURKMENIA. REPORT IV. POPULATION GEOGRAPHY OF HEMOGLOBINOPATHIES

Moscow GENETIKA in Russian Vol 20, No 9, Sep 84 (manuscript received 12 Aug 83) pp 1536-1541

TURAYEVA, Sh. M., GINTER, Ye. K., REVAZOV, A. A., GAR'KAVTSEVA, R. F., KIYATKHANOV, B. A., CHAGYLOV, K. B., SOTNIKOVA, Ye. N., SOLOV'YEVA, N. P. and ASANOV, A. Yu., Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow

[Abstract] A study of the population geography of hemoglobinopathies of Turkmenia was performed, including the spectrum and frequency, territorial and ethnic specifics of occurrence of hemoglobinopathies, the genetic heterogeneity of hemoglobinopathies and the relationship between specifics of occurrence of hemoglobinopathies and genetic structure of the population. The work allows evaluation of the significance of the problem of hemoglobinopathies for public health in Turkmenia, determination of regions with high frequency of mutant genes and direct determination of carriers of individual forms of hereditary hemoglobinopathies for prospective medical-genetic consultation. Some 3332 persons were tested in the 5 oblast centers of Turkmenia, revealing a broad spectrum of mutations related both to disruption of globin structure and reduced rate of globin chain synthesis. There are definite geographic and intraethnic differences in gene frequencies of  $\beta$ -thalassemia and the effect of genetic drift is noted. References 7:

3 Russian, 4 Western.

[127-6508]

UDC: 575.591

MEDICAL-GENETIC STUDY OF THE POPULATION OF TURKMENIA. REPORT V. POPULATION-DEMOGRAPHIC DESCRIPTION OF THE NOCHUR ISOLATE

Moscow GENETIKA in Russian Vol 20, No 9, Sep 84 (manuscript received 1 Nov 83) pp 1542-1548

REVAZOV, A. A., GINTER, Ye. K., ASANOV, A. Yu., GAR'KAVTSEVA, R. F., TURAYEVA, Sh. M., NURMURADOV, K. N., BOL'SHAKOVA, L. P. and KOROLEVA, A. G., Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow

[Abstract] A population-genetic description is presented of the Turkmenian Nochur isolate. The Nochur population has features relating it to both rural populations of low density as in India and Africa and geographically isolated island or mountain populations as in Dagestan and Pamir. A population-demographic description and migration picture are presented. Tribe composition and inbreeding characteristics are noted. The Nochur isolate is a system of subpopulations in a geographic isolate. Immigration is purely marital and

there is a flow of emmigrants to the capital of the republic, Ashkhabad. A high coefficient of inbreeding was found, minimum estimate 0.03298, maximum 0.0529. The distribution of genetic markers ABO, MN, Hp, P and Rh is presented. References 13: 10 Russian, 3 Western.  
[127-6508]

HUMAN FACTORS

UDC: 615.471.03:[612.763.612.821]-087

INSTRUMENT FOR DETERMINING SPATIAL COORDINATION OF HAND MOVEMENTS

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 16 Mar 84) pp 49-51

KUTSENKO, G.I., SOSHNIKOV, Ye.I. and MINCHIN, B. N., All-Union Scientific Research Institute of Social Hygiene and Organization of Public Health imeni N.A. Semashko, Moscow

[Abstract] It is often necessary to estimate the status of the function of coordination of the movement of the hands as well as changes in the status of this function during the course of a working day. Existing devices intended to study this function have a number of shortcomings, particularly the ability of the test subject in each case to determine the speed at which the test task will be performed. A method is suggested for determining spatial coordination of movements of the hands utilizing a test involving closing of an electric circuit by moving the hand and an indicator in a horizontal plane intended to eliminate these shortcomings. The method is distinguished by the fact that to make diagnosis of the functional status of the motor apparatus more objective, the test subject is forced to move the indicator at a predetermined rate. The subject views a pie-slice sector of a wheel with a wavy connector strip and must track the apparent movement of the strip with a contact. The machine automatically records the number of times the subject touches the connector as well as the total time spent in contact with the connector. This allows objective determination of the deterioration of coordination during the course of a working day.

[118-6508]

IMMUNOLOGY

UDC 576.895.771.095.15:615.932.9

PROLONGED STORAGE OF MALARIA PARASITES AT TEMPERATURES OF LIQUID NITROGEN:  
INFECTIVITY AND CAPACITY FOR GAMONT FORMATION

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4,  
Jul-Aug 84 (manuscript received 20 Jul 83) pp 28-31

OGANESYAN, A.S., Institute of Medical Parasitology and Tropical Malaria  
imeni Ye.I. Martsinovskiy, USSR Ministry of Health, Moscow

[Abstract] The effect of storage for various periods of time in liquid nitrogen vapors on the preservation of asexual and sexual forms of strains of *P. berghei* and *P. gallinaceum* and their capacity to infect experimental animals and mosquito-carriers is described and discussed. Preservation of *P. berghei* (strain H) in different stages was monitored during prolonged storage of 42 up to 274 days. Higher survival rate during long storage was seen in mature trophozoites and schizonts than in ring-forms. During prolonged storage of *P. berghei* strain NK65, preservation of viable gamonts was proven by infection of *Anopheles stephensi*. Blood samples infected with *P. gallinaceum* retained the capacity to infect chicks and chicken embryos after the samples were thawed. References 9: 3 Russian, 6 Western.  
[1675-2791]

## RADIOPROTECTIVE EFFECT OF INTERFERON

Riga SOVETSKAYA LATVIYA in Russian 18 Dec 84 p 4

ZASUKHINA, G., doctor of medical sciences, professor, head of the laboratory of viral genetics, Institute of General Genetics imeni Vavilov, USSR Academy of Sciences

[Abstract] The author comments on studies of the role of interferon in the reparation systems of cells at the virus genetics laboratory of the USSR Academy of Sciences' Institute of General Genetics imeni Vavilov, and she mentions some of the organizations which are cooperating with the laboratory.

A cycle of experiments performed jointly with associations of the Moscow Engineering Physics Institute reportedly demonstrated that interferons protect human cells cultivated in a test tube against the action of fast neutrons and gamma radiation. Cells treated in advance with interferon not only survived irradiation but were almost totally protected against harmful effects of fast neutrons on the structure of chromosomes, according to the author. She mentions that the laboratory has also been studying effects produced on cells by compounds of heavy metals and other chemical compounds, including ones which cause breaks in the DNA molecule. Interferon's ability to protect cells against effects of chemical compounds has been studied in this connection.

Another direction of the laboratory's work is research on interferon's effects on blood cells of persons suffering from certain hereditary diseases in which restorative processes of cells are impaired. The purpose of this is to develop courses of treatment which will not cause irreversible damages to chromosomes, the author explains. Interferon has been found to stimulate the reparation systems of cells in cases of Marfan's syndrome, for example.

FTD/SNAP  
CSO: 1840/201

UDC 619:616.986.7:616-074

## FLUORESCENT ANTIBODY TECHNIQUE IN DIAGNOSIS OF LEPTOSPIROSIS

Moscow VETERINARIYA in Russian No 11, Nov 84 pp 69-71

MALAKHOV, Yu.A., BELOUSOV, V.I., SOLOV'YEVA, V.S., SOBOLEVA, G.L., OSIPOVA, G.M. and SHOROKHOV, V. V., All-Union State Scientific Control Institute of Veterinary Preparations

[Abstract] Polyvalent and monovalent antibody preparations against various serological groups of leptospira were tested for their utility in the diagnosis of leptospira by fluorescent antibody techniques. Application of this method to experimentally infected hamsters and autopsy materials obtained in the course of routine examination of domestic animals (cattle, pigs) demonstrated the usefulness of this technique. In particular, techniques utilizing the polyvalent serum show generic specificity in the case of fresh materials, as well as with specimens stored for up to two days at 2°C. This approach to the diagnosis of leptospiral infections requires only one day for completion, while the fluorescent antibody itself retains activity for at least two years when stored at 2-15°C.  
[1706-12172]

## ARTIFICIAL ANTIGENS AND VACCINES

Moscow PRAVDA in Russian No 10, Oct 84 pp 3-12

PETROV, R.V., academician, USSR Academy of Medical Sciences, Institute of Immunology, USSR Ministry of Health

[Abstract] A review is presented of the study of artificial or synthetic antigens and vaccines, as a means of securing potent immunogens of potential clinical use. The essential approach consists of the use of defined haptens coupled to various carriers, with the haptens corresponding to key antigenic determinants on a given pathogen. The author and his colleagues were successful in following Landsteiner's classical work, i.e., using haptens coupled to polyelectrolytes such as poly-2-methyl-5-vinyl pyrrolidone. The key advantage in the use of such carriers is that they themselves act as effective immunostimulants to greatly enhance the antibody response. Figures 9; references 19: 10 Russian, 9 Western.  
[199-12172]

PROTEIN SYNTHESIS AND DNA REPLICATION OF LYMPHOCYTES IN IMMUNE RESPONSE

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 98, No 5, Sep-Oct 84  
pp 193-205

NIKOLAYEVA, A. I., Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] This is a review of studies of two major questions: what molecular events occurring in the lymphoid cell in response to stimulators are critical for development of the proliferative response; and, what contribution do these events make to formation of specificity of the immune response. In D lymphocytes administration of an antigen causes stimulation of protein synthesis, which, however, begins to be inhibited quickly. The increase in rate of protein synthesis in lymphocytes immediately after exposure to an antigen is not related to the synthesis of new ribosomes or increase in the rate of synthesis of individual protein molecules. The changes in the RNA synthesis in lymphocytes after stimulation are discussed. The most intensive synthesis of specific antibodies per antibody-forming cell must occur in the first stage of the immune response before the beginning of DNA replication. The antigen determines both the degree of total proliferative response in the population of lymphocytes and the appearance or increase in number of antibody molecules which are specific for the antigen. Antigen-dependent stimulation of overall protein synthesis occurs in up to 20% of the cells of a population. The number of cells producing specific antibodies to a given antigen is usually not over 0.005-0.01%. The antigen stimulates protein synthesis in a definite fraction of the lymphocyte population. The reaction of a population of lymphoid cells to a stimulating agent such as an antigen includes two phases: the nonspecific and specific phases. The earlier is the actual phenomenon of stimulation of protein synthesis in the cells. During the second phase the rate of synthesis of specific proteins such as antibodies increases and the number of antibody-forming cells increases. The specific phase of the immune response is impossible without the nonspecific phase.

References 77: 16 Russian, 61 Western.

[1618-6508]

LASER EFFECTS

UDC 617.735-005.4-085.849.19-036.8

LATE RESULTS OF LASER COAGULATION OF OCULAR FUNDUS IN ACUTE ARTERIORETINAL OCCLUSION

Odessa OFTAL'MOLOGICHESKIY ZHURNAL in Russian No 7, 1984 (manuscript received 30 May 84) pp 398-401

SAPRYKIN, P.I., professor, SUMAROKOVA, Ye.S., senior scientist, and SEMENOVA, T.N. and ZARETSKOVA, T.M., physicians, Chair of Ocular Diseases, Saratov Order of the Red Banner of Labor Medical Institute

[Abstract] A group of 90 patients were divided into equal groups on the basis of standard drug therapy of acute ocular arterioretinal occlusion or a combination of argon laser coagulation plus standard chemotherapy. The effectiveness of treatment was evaluated on the basis of visual acuity, perimetry, and electrophysiologic studies. In 64.5% of the 45 patients subjected to the combination of laser treatment and drugs, an improvement in visual acuity of 0.02-0.9 units was obtained, while a similar degree of improvement was seen in only 42.2% of the 45 patients treated only with drugs. In addition, laser coagulation shortened the hospitalization period to 12.8 days versus a standard stay of 16.8 days, and was characterized by earlier electrophysiological improvements. The electrographic studies also provided objective information as to the probability of a successful outcome of laser therapy. Figures 1; references 8: 5 Russian, 3 Western.

[1688-12172]

UDC 617.735-005-007.271-095.849.19

POSSIBLE MECHANISMS OF THERAPEUTIC EFFECTIVENESS OF LASER COAGULATION IN RETINAL VESSEL OCCLUSION

Odessa OFTAL'MOLOGICHESKIY ZHURNAL in Russian No 7, 1984 (manuscript received 18 Jun 84) pp 401-403

BOCHKAREVA, A.A., professor, and IVANISHKO, Yu.A., candidate of Medical Sciences, Chair of Ocular Diseases, Rostov Medical Institute; North Caucasian Laser Ophthalmological Center

[Abstract] An analysis was conducted of the factors that determine therapeutic effectiveness of laser management of arterial occlusion in retinopathy. Analysis of such procedures performed over a period of seven years has shown that laser therapy is most effective in restoring arterioretinal patency in those cases in which the zone of occlusion can be accurately delimited, and paravasal coagulation is carried out in conjunction with macular barrage. Such an approach resulted in arterial patency within 2-5 days in 14 out of 18 cases, with an increase in visual acuity from 0.01-0.06 to 0.2-0.8. Factors leading to clinical improvement are believed to be due to the formation of chorioretinal scars which lead to retinal wrinkling and the appearance of horizontal tractions. The resultant distortion of the occluded vessels increases wall boundary blood flow and the exposure of the thrombus to various exogenous (drugs) and endogenous thrombolytic factors, in conjunction with vascular shock which also serves to enhance hyperemia. A concomitant factor is the formation of vertical adhesions along which chorioretinal anastomoses are formed, and which facilitate drain edema fluid. Figures 4; references 16: 11 Russian, 5 Western.

[1688-12172]

UDC 617.723-002.5-085.849.19

ARGON LASER COAGULATION IN FOCAL CHORIORETINITIS

Odessa OFTAL'MOLOGICHESKIY ZHURNAL in Russian No 7, 1984 (manuscript received 1 Mar 83) pp 414-416

BALASHEVICH, L.I., candidate of medical sciences, Leningrad

[Abstract] Argon laser coagulation was employed in the management of 17 cases (18 eyes) of focal chorioretinitis; in 10 cases the chorioretinitis was determined to be tubercular and in 1 toxoplasmotic. On the average, an increase in visual acuity from 0.3 to 0.34 ( $P > 0.05$ ) was secured in a third of the patients, and avascular scar tissue formed at the site of inflammation. Importantly, there were no recurrences of chorioretinitis during a six-year follow-up period, indicating that argon laser therapy is an effective therapeutic modality in the management of such disorders. Figures 4; references 6: 4 Russian, 2 Western.

[1688-12172]

MEDICINE

PRESSURE SUIT FOR RESTORING CIRCULATION

Frunze SOVETSKAYA KIRGIZIYA in Russian 12 Jan 85 p 4

[Article by A. Rozeniyene]

[Text] A new 'suit' which has been developed by Ralfs Birkis and Ugis Iskrovs, students of the Riga Medical Institute, will help to save a considerable number of lives. This conclusion has been reached by specialists who conducted practical tests of the future physicians' invention.

It all began two years ago, when R. Birkis and U. Iskrovs (they were second-year students of the institute then) decided to develop a special suit for restoring circulation when sharp drops in patients' blood pressure occur. Such drops usually occur in cases of serious trauma, including those resulting from automobile accidents, in various allergic states, and in other impairments of the functioning of the cardiovascular system.

After two years, Ralfs Birkis and Ugis Iskrovs succeeded in developing a 'suit' which operates on the principle of mechanical construction of blood vessels of the lower extremities from the effect of air forced under pressure into the suit. It is not a suit in the ordinary sense, of course. The garment in question is a pair of trousers which tie at the bottom. Inflatable rubber cuffs are sewn into the trouser legs. When these cuffs are filled with compressed air, they cause blood to flow from the legs. The trousers are made of a dense cotton fabric and are put on over special undertrousers made of a soft, slick cotton fabric.

The first prototypes of the pressure suit, as it is now called by its inventors and specialists, have been tested at the Latvian Republic Clinical Hospital. It has been established that use of the suit will allow average arterial pressure to be increased by 20-25 percent.

Birkis and Iskrovs are now working on making the pressure suit suitable for intensive therapy in ambulance vehicles and stationary cardiologic facilities, and also for performing functional tests in sports-physiology laboratories.

FTD/SNAP  
CSO: 1840/203

GEORGIAN BURN CENTER

Tbilisi ZARYA VOSTOKA in Russian 17 Jan 85 p 4

[Article by A. Kikodze]

[Excerpt] The republic center for thermal injuries has received permanent quarters in a complex consisting of two new interconnected six-story buildings on Kapanadze Street in October Rayon [in Tbilisi].

This center's new facilities will make it possible to treat the injured far more effectively, since the number of beds has more than tripled: there are now 110 of them instead of 30. Two burn wards have opened here, one for adults and one for children, and there is a department of rehabilitation and reconstructive and restorative plastic surgery for burns.

"Pressure chambers for both inpatient and outpatient treatment will be installed in the new center," related docent Besik Iashvili, head of the center.

"A method of treatment employing a laser scalpel is being introduced. Our specialists are mastering a new direction for studying the mechanism of impairment of various systems of the body in burn cases; in particular, they are studying impairments of the blood's coagulative system and of peripheral blood flow. This is a great importance for purposeful tactical treatment of burn disease. With the aid of new equipment, patients will also be treated more successfully, in the special conditions of an abacterial (sterile) environment. Moreover, it has become possible also to treat frostbite victims.

"The republic center has close contacts with the All-Union Burn Center of the USSR Academy of Sciences' Institute of Surgery imeni Vishnevskiy, the USSR Academy of Medical Sciences' Scientific Research Institute of Medical Radiology in the city of Obninsk, and the republic burn center in Kiev, as well as research centers of our own republic."

FTD/SNAP  
CSO: 1840/203

COMPUTERIZED INSTRUMENT COMPLEX FOR NEUROLOGY RESEARCH

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Dec 84 p 3

[Text] Minsk -- A system of instruments based on a microcomputer permits the automation of complex experiments for the study of mechanisms of nervous activity. This system was developed at the Belorussian Academy of Sciences' Institute of Physiology. The system reduces research time tenfold and heightens the quality of research.

The automation equipment enables scientists to comprehend more quickly complex processes taking place in a living organism, and to accomplish in a matter of months research which formerly took many years.

In a contest of the republic Academy of Sciences, the institute scientists' development was recently judged the best of a number of systems for automating scientific experiments. Physiologists are not the only specialists for whom it is suitable. It has been tested successfully by botanists in the course of ecological research, and also by scientists of the Belorussian Scientific Research Institute of Cardiology.

FTD/SNAP  
CSO: 1840/201

## MEDICAL SERVICES AND INTERNS

Kiev RABOCHAYA GAZETA in Russian 13 Dec 84 p 3

[Article by A. KARPOV, candidate of medical sciences, chief physician of the Oblast Clinical Hospital imeni Mechnikov, Dnepropetrovsk]

[Text] Public health practice, supported by the latest achievements of medical science, with ever-increasing confidence, is constantly expanding the once enigmatic and mysterious art of healing. A good example of this can be seen in our own Dnepropetrovsk Oblast. Quite recently we were the first in the republic to organize a mobile hemosorption (clearance of chemical poisons from the blood) unit for on-site operation. A specially-equipped ambulance with a resuscitation crew goes out at the first report from any inhabited locale of the oblast, and hooks up the patient to the equipment on the spot. While the victim is being brought to us at the hospital, he is already getting intensive care. The enthusiastic proponents of this new trend -- Chief of Emergency and Planning-Consultative Aid S. A. Beshta and Assistant Yu. S. Petrenko of the Department of Anesthesiology -- have not only suggested the idea of this type of assistance, but have improved the method which until recently was considered to be an in-hospital service only. Let us just take the situation of an assistant. According to the "Regulation" he is supposed to perform the functions of a physician in his own field of specialization, along with his teaching and scientific research. Let's say he is on duty. What happens, as a matter of fact? Frequently, that regulation is not fulfilled. Moreover, we are forced to expend a lot of effort and energy to organize therapeutic and diagnostic work in the departments. Why? Assistants, graduate students, and clinical resident physicians are often given released time to write their dissertations and are sent on assignments that are completely unrelated to their activity, and department heads release them for other kinds of things, and often don't even take notice of them at all. By the same token, the young candidate for a scientific degree, even at the beginning stage of his career, is encouraged to evade and abandon the very difficult and oftentimes complex work of the medical scientist. It seems to me that it would be very advisable if the chief physician of a department could exert effective leverage over the personnel in patient care departments. At least they should get paid at the hospital, and not at the institute. Thus, assistant of the therapy department of the Dnepropetrovsk Medical Institute K. G. Karapetyan brings patients to the cardiology division of our hospital. As if it is not enough that he is not trained to scrutinize

the patients' condition constantly, but he also does not always perform the assignments of the departmental professor who consulted this patient. Why such disorder? Surely, he was taught that each patient must be seen as a person for whom respect and compassion must be shown and that the patient must be treated in accordance with the moral code of a Soviet physician. To our shame, we still have such candidates for scientific titles in our clinics. Apparently, such behavior is influenced by the internship program. We expect young talent in the hospitals. The state provides them with advance pay, we assign to them highly skilled medical personnel whom we pay to work with the interns. For example, more than 60 VUZ graduates are sent to us annually. Unfortunately, they do not all live up to our expectations. Some often don't report for work or come late. We get this kind of situation: An intern leaves the institute, but in fact never reaches the hospital. He is registered in the internship department at the institute, but receives his pay (no small sum) at the hospital. Perhaps internship departments should be formed directly at hospital clinics or oblast public health departments? The intern's responsibility for his work and training in the program should be the same as the responsibility expected of a practicing physician. Then there would be an absolute improvement in discipline and greater responsibility for the patient's fate as well as the very level of medical training. And, is it not a paradox that if, let us say, an intern is, at best, merely reproved for passing an examination in a field that is not his specialization? No one deprives him of a diploma. He gets a position anyway with the same salary. In my opinion, this is an inadmissible and unjustified luxury. There must be no special allowances made for youth, fatigue, or professional and moral immaturity. Such is the responsible work that we medical people have. And these are the kind of responsible people that we in the Soviet medical profession must be.

6289

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1984

## CONFERENCE ON COMPUTERIZATION OF PREVENTIVE MEDICAL EXAMINATIONS

Moscow MEDITSINSKAYA GAZETA in Russian 12 Dec 84 p 1

[Article by A. Bogoraz]

[Excerpt] An all-union conference on the development of automated information systems and medical technology for preventive medical examinations of the population has taken place at the All-Union Scientific Research and Testing Institute of Medical Technology (VNIIIMT). The conference was organized by the USSR Ministry of Public Health. Taking part in its work were specialists of enterprises and institutes of 10 industrial ministries and major public health organizations.

A program report was given by Professor, Doctor of Technical Sciences B. I. Leonov, director of VNIIIMT. Medical workers face an acute problem in the processing of huge masses of medical information, he said. This necessitates the combining of automated equipment with modern data processing complexes. There is a need for automated instruments with improved properties, with new means of displaying, processing and representing information, and with modern computer systems operating, as a rule, on the basis of microcomputers and microprocessors.

Much interest was aroused by a report by G. S. Popov, head of the Latvian SSR Public Health Ministry's Administration of General Medical Care, and Ye. K. Vlasova, chief physician of the medical and safety section of the "Motorostroitel'" (engine builder) Production Association (Zaporozh'ye).

The comprehensive automated system for medical examinations of the population ("KASMON") which was developed by the Riga Medical Institute in 1983 permits routine detection of principal types of pathology in accordance with 15 medical profiles, using "Iskra-1256" and "Isrka-226" computers. A person undergoing an examination fills out a special card with 67 questions. Also entered on this card are data from laboratory analyses, measurements of growth, weight and blood pressure, electrocardiograms and fluorograms, and external-respiration and visual-acuity functions. All of these data are fed into a microcomputer in a medical-examination room, and the computer itself prints out a conclusion with referral to specialists.

The automated system for preventive medical examinations has been functioning at the "Motorostroitel'" Production Association since 1980. This system operates on the basis of the plant computer center, which has YES-1045 computers.

Participants in the conference agreed to continue the formulation of a unified medical technology concept for the construction of automated systems and instruments for preventive medical examinations, and to utilize microprocessors more broadly. A decision was also adopted to request the leaders of a number of industrial ministries to accelerate the production of equipment for conducting preventive medical examinations of the population.

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## SOVIET-AMERICAN COLLABORATION ON ARTIFICIAL HEART

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 5 Oct 84 p 3

[Interview with Sung-Van Kim, professor of the University of Utah and specialist on biological materials, and Professor V. I. Shumakov, corresponding member of the USSR Academy of Medical Sciences, USSR State Prize winner, and director of the Scientific-Research Institute of Transplantology and Artificial Organs, by A. Zhukov and L. Zagal'skiy: "Is a Plastic Heart Possible?"]

[Excerpt] [Question] At the beginning of the 70's, when there was a positive movement in Soviet-American relations, the governments of our two countries made a number of very important agreements in the area of medicine, opening up broad possibilities for collaboration of Soviet and American scientists in joint programs of research. Has the sharp worsening of Soviet-American relations, at the fault of the White House administration, had any effect on these programs?

[V. Shumakov] Indeed, the collaboration between Soviet and American physicians in the mid-70's reached a very high level, and contacts and exchanges began to occur on a regular basis. But the worsening of the political climate in the relations between the two countries, which occurred at the fault of the Reagan administration, and the "crusade" declared against communism, had a negative effect on the entire complex of joint Soviet-American medical research.

[S.-V. Kim] With the arrival of President Reagan in the White House, many of my colleagues were denied the opportunity to continue regular contacts with Soviet scientists. And the point was not only that "suddenly" joint research had become, as our publications are now writing, "ineffective." On the contrary, the mutual enrichment of scientists and the exchange of information is not only important, but without it science at the end of the 20th century cannot be developed.

Fortunately, the "Artificial Heart" program, 75 percent financed by the National Heart Institute, did not fall under the knife of the federal government's restrictions and curtailments. Last year I was lucky enough to welcome to my biological materials laboratory in the University of Utah the Soviet scientist-biochemist Doctor V. Sevast'yanov, from the

Scientific-Research Institute of Transplantology. The materials of our joint 2-week experiments were enough for an entire year of work for the whole laboratory. Now I am in Moscow, and the first results of my stay in the USSR are difficult to evaluate.

[Question] So when will the problem of the artificial heart be finally resolved?

[S.-V. Kim] It is difficult to answer that question. I would venture to state that the production of artificial hearts and systems of providing for them should begin in the next few years. Many technical problems have already been solved. I will add that successful Soviet-American collaboration will promote the solution of this problem. We in the United States have the complete technology. But in the USSR there are outstanding surgical and experimental schools. We cannot get along without each other. Only the high cost of the operation can stop the research. Today it varies in the range of \$100,000; moreover, 70 percent of this figure is the cost of staying in the hospital.

[V. Shumakov] It is probably worth repeating in today's conversation a fact which is obvious to every Soviet individual: no matter how much the operation of artificial heart implantation, or any other, costs, it will be done only on the basis of medical indicators. And absolutely not on the basis of one's bank account.

It is something else which worries us. It is necessary to "drive" the program to a state in which the best medical results are obtained.

12255  
CSO: 1840/1570

## MORAL DECAY AMONG MEDICAL STUDENTS

Moscow MEDITSINSKAYA GAZETA in Russian 23 Nov 84 p 3

[Article by V. Bondar', correspondent for MEDITSINSKAYA GAZETA: "Decline"]

[Text] Krasnoyarsk--The noisy crowd of drunken people burst into the dorm. In the hallway they overturned a table and chairs, made a scene with the duty-person, and began to force the doors of one room and then another. They started a brawl and cruelly beat a third-year student... They, now former students of the Krasnoyarsk Medical Institute, had to answer for this.

How did these people turn up among those who had decided to dedicate themselves to the most noble and humane profession? And would such doctors be of any use at all?

It is not an idle question. At times they wait impatiently in a rayon for a young specialist, they count on him. And it turns out to be the wrong person; there is only unpleasantness with him. The new Artyemovsk municipal hospital, for example, was in a similar situation. Having finished the institute and then an internship in Krasnoyarsk, A. Vinogradov arrived for work there a year ago. The young surgeon was greeted warmly and set up well. But disappointment came shortly after. The newcomer did not aspire to his work, he treated patients coldly, avoided his social duties, and on top of that he smelled more and more often of alcohol. They spoke with Vinogradov officially and talked, as they say, heart-to-heart with him. All to no avail. Thus the question arose: does the hospital need a specialist who constantly undermines the collective and inflicts moral losses on it?

Two facts. Different in detail, but their essence is the same: immorality and moral decline. One involuntarily begins to think: the above-mentioned former students and the young specialist from the rayon did not come to their sad end suddenly. And one can hardly believe that in the institute the process of their degradation passed hidden from their teachers, classmates, and friends. It stands to reason that they noticed something wrong. However they did not take any measures. They remembered too late, when they should already have been expelled from the institute.

"Well, attrition is a natural occurrence," says B.S. Grakov, the dean. "It has been provided for. And we keep within this norm."

True, the norm is almost justified. Only, there is attrition, and there is attrition. Many, particularly upperclassmen, are expelled for breaking rules and for amoral behavior. In this year alone, 14 people found themselves eliminated for this reason.

It would seem that the dean would play a principle part in the evaluation of these indisputable facts, would aid in an objective understanding of them and in a comprehensive analysis of whether or not there were omissions in the ideological-educational work with students and where, at what stage some of them begin to decline morally. However, B.S. Grakov took another position. Unfavorably perceiving the aim of the correspondent's visit to the institute, he strove more to defend the honor of the regiment than to penetrate deeply to the heart of the matter. According to him, violations of the rules are not typical for the institute, and if one talks about amoral behavior, there is no less of that in other VUZ's.

It is hardly possible to agree with such an opinion. Amoral behavior on the part of a student is always a CHP [Extraordinary Occurrence] for a VUZ, for a medical VUZ triply so. And every incident should be examined from a position of the highest moral and civic maturity, from which a physician in no circumstances has a right to depart.

Lack of principle, complacency, underestimation of the significance of educational work can in no way facilitate the formation in students of kindness, decency, and a deep understanding of professional obligation--all of the things without which one cannot imagine a medical worker. And if a student is insufficiently tempered in an ideological sense and moreover morally unsteady, sooner or later it will be manifested in his behavior.

For example, the uproar has still not quieted down in Krasnoyarsk over the sensational story of one of the emergency brigades, headed by the young physician Plotnikov. We will not retell it, but make note of the end result; Plotnikov, a recent graduate of that same Krasnoyarsk medical institute, appeared before the court and got his just deserts, and the brigade members--these were upper-classmen earning extra money on the ambulance--were dropped from the VUZ.

B.I. Khromechek, deputy secretary of the institute partkom [party committee], also tried, at first, to present the educational work with students as a clearly developed effective system, similar to a council for the prevention of violations of the rules, of which he is the chairman.

Actually, the council is not inactive. Every amoral act is examined at its sessions. But this is after the fact. While in fact the primary purpose of the council is to prevent infractions.

The facts bear witness: the majority of amoral acts are committed by students in a state of intoxication. And it is no secret from anybody in the VUZ where the future specialists hit the bottle. Investigator I.I. Yakovlyev, looking into one of the unsavory stories indicated as much in one of the documents: "Drinking parties are often organized in the dormitory of the medical institute." Yu.S.

Vinnik, chairman of the institute profkom [professional committee] intimated that peace and quiet and cultured recreation are guaranteed in the student dormitories; these assertions do not conform to this official report.

But it is possible to rest in various ways. V.I. Sharovoy, dean of pediatric department, and I stopped in one of the rooms and marvelled. There was a full plate of cigarette butts on the untidy table. There was also a cake-box full of butts sitting on the floor by the bed. The bed was unmade. One begins to doubt that medical students live here.

We ask third-year student A. Kurumchin why the room is not tidied up. The guy shrugs his shoulders vaguely. It is everywhere apparent: disorder does not bother him. What kind of medical culture will the future specialist take away from the VUZ? An analysis of mass-cultural measures graphically shows: moral influence on youth has weakened.

Of course individual work with students, heart-to-heart talks, means a lot. It is good that more attention has recently begun to be paid to curatorship. However, this very necessary form of educational work is still often ignored. The reason is this: there is a great deal of trouble, and the teachers are overloaded as it is. But this is an important matter, and there are enthusiasts. For example, M.N. Maksimova, an assistant professor in the stomatology department. Curatorship is not a chore for her; the fate of a ward is of concern to her. She helps with studies, is interested in the students life and in how he spends his spare time. Before such a person one would be embarrassed by unseemly behavior.

Everything that surrounds a student in the institute should play a definite positive role in the formation of his attitude and the creation of a steady immunity to negative occurrences.

12461  
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## BRIEFS

ONCOLOGICAL CONFERENCE MEETS--The All-Union Conference of Leaders of Oncological and Roentgen-Radiological Scientific-Research Institutes of the Nation, which concludes its work today in Kishinev, is devoted to problems of preventing and treating malignant tumors. "The conference was called by the Scientific Council of the Academy of Medical Sciences," said G. Khonelidze, director of the Moldavian Scientific-Research Institute of Oncology. "Its participants examined the State Program of Scientific Research on Malignant Tumors for 1986-1990. This program embraces various aspects of scientific research in the field of oncology. Primary attention is focused on creating new methods of diagnosing malignant tumors, developing anti-tumor drugs, and methods of integrated treatment of oncological diseases. Great attention has been focused on the scientific organization of preventing the start of malignant tumors." In accordance with the June 1983 CPSU Central Committee Plenum, which set medical science and health care the task of conducting yearly dispensarization of the entire population of the country, the conference also discussed the role of oncologists in universal dispensarization [preventive examination] of the population. [Text] [Kishinev SOVETSKAYA MOLDAVIYA in Russian 23 Oct 84 p 3] 12255

CSO: 1840/1570

## ACUPUNCTURE RESEARCH

Leningrad LENINGRADSKAYA PRAVDA in Russian 11 Dec 84 p 4

[Abstract] This article is an interview with Aleksandr Trofimovich Kachan, docent and head of the chair of reflexotherapy of the State Institute for Advanced Training of Physicians imeni Kirov, on the occasion of the opening of the Fourth All-Union Conference on Reflexotherapy in Leningrad. Kachan served as deputy chairman of the organizing committee of this conference. It was attended by more than 550 Soviet specialists, as well as scientists from 12 other countries. Kachan mentions that papers heard at the conference dealt with such topics as reflexotherapy for disorders of internal organs and the endocrine systems, neuroses and borderline conditions.

Kachan goes on to discuss directions of work which Leningrad scientists are doing in puncture therapy. He notes that acupuncture, for example, has been found to be particularly effective in the treatment of neurological and allergic pathology, and of diseases of the ear, nose and throat. More than 900 persons have trained in acupuncture in the advanced-training institute's chair of reflexotherapy, where studies of acupuncture points have been in progress for 10 years.

Kachan recalls that a special laboratory headed by Professor E. D. Tykonchis-kaya formed the original nucleus of this chair of instruction. Its current activities include studies of nerve formations at acupuncture points, using focused ultrasound, and its specialists have introduced a method called auricular puncture therapy. This method, in which diagnoses are made on the basis of 110 points on the floor of the auricle, is used for quick diagnosis of neurological disorders and other ailments. Studies of effects produced by ultrasound, lasers, magnetic fields and electric currents in puncture therapy have yielded promising results, according to Kachan. It has been found that electropuncture helps to reduce pain during and after operations, for example. The electropuncture method is said to be quick-acting and very effective for short periods.

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## MEDICAL DIAGNOSTIC TECHNOLOGY R&D AT CYBERNETICS ASSOCIATION

Tashkent PRAVDA VOSTOKA in Russian 11 Jan 85 p 3

IKRAMOVA, Kh., doctor of technical sciences

[Abstract] The author reports on advances in computer-aided diagnostic methods at Uzbek medical facilities, thanks to efforts of the Uzbek Academy of Sciences' "Kibernetika" Research and Production Association.

Computerized diagnostic systems called "Virus-EVM" [virus--computer] and "Glaz-EVM" [eye--computer] have been developed at the "Kibernetika" Association. "Virus-EVM" is employed in a consultative-and-diagnostic center operating in the dialog mode. It was developed in collaboration with the clinic of the chair "Infectious Diseases" of the Tashkent Institute for Advanced Training of Physicians. Information on the condition of patients is transmitted by teletype from this clinic to the Association's computer center. With this information, a computer prepares diagnostic charts for physicians, whose advice and comments are then sent back to the clinic. With the "Virus-EVM" system, physicians can also obtain prognoses of the course of illnesses, diagnostic charts for certain classes of mass infectious diseases, and differential diagnostic tables for the recognition of such diseases as influenza and viral hepatitis. The system is being used also in routine forecasting of anticipated epidemic situations.

The "Glaz-EVM" system was developed under the direction of Candidate of Medical Sciences Kh. Kamilov and is now being used at the republic eye clinic and at clinics in Nukus and Dzhizak. With the aid of telemeter developed at "Kibernetika", information on the condition of patients is transmitted directly from these clinics to a computer at the Association. Drawings and recommendations prepared by the computer enable physicians at the clinics to identify eye damage and determine its seriousness.

Work on mathematical models of the functioning of the heart and on systems for controlling artificial organs is said to be also in progress at the Association. Associates under the direction of Candidate of Medical Sciences B. Allamiyarov are working on miniature instruments for use in an artificial pancreas, for example. Personnel under the direction of Candidate of Technical Sciences F. Adylova developed a method for selecting artificial heart valves.

The author notes, in conclusion, that a number of projects utilizing mathematical modeling have been included in an immunology program of the USSR State Committee for Science and Technology. At the same time, she says that ties between developers and users of medical cybernetic methods need to be improved, and that topics of research projects employing mathematical methods and computer technology must be defined more precisely at institutes and higher schools of the Uzbek SSR Ministry of Health.

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UDC: 613.644-07:612.015.3:577.118

## INFLUENCE OF INFRALOW FREQUENCY NOISE ON TRACE ELEMENT METABOLISM

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 7 Feb 84) pp 91-92

SHVAYKO, I.I., KOZYARIN, I.P., MIKHALYUK, I.A. and MOTUZKOV, I.N., Kiev Medical Institute

[Abstract] A study was performed on male white rats, which were exposed to infralow frequency sound at 8 Hz, intensity 90 dB, 115 dB or 135 dB for two hours per day each day for four months. The balance of trace elements was studied after month one and month four of the experiment by placing the animals in special metabolic cages where urine and feces were collected for five days to determine the content of trace elements. At the end of the experiment the animals were decapitated and redistribution of trace elements in the organs was studied. The content of copper, molybdenum, iron and manganese was studied in the tissues and excretions by quantitative spectrographic methods. It was found that infralow frequency sound at 135 dB caused a decrease in the copper in excretions, 115 dB caused a smaller decrease, while 90 dB did not change the level. There was a reliable increase in copper content in the organs in the 135 dB group, a smaller increase in the 115 and 90 dB groups. Similar changes were observed for the other trace elements. References 5 Russian.

[118-6508]

## FLUOROCARBON BLOOD SUBSTITUTES

Moscow IZVESTIYA in Russian 29 Dec 84 p 3

IVCHENKO, L., correspondent

[Abstract] This article reports on the development of a blood substitute called 'perfluorane' at the USSR Academy of Sciences' Institute of Biophysics. It is said that the development of the blood substitute is a result of research in chemistry of perfluorocarbons under the direction of Academician I. L. Knunyants.

The author of the article visited the biophysics institute's laboratory of medical biophysics. Doctor of Medical Sciences F. Beloyartsev, head of the laboratory, and Candidate of Medical Sciences B. Islamov, an associate, showed the author tests of the blood substitute in beating hearts that had been removed from rabbits, and they talked about the substitute's advantages. Islamov said that in comparison with other blood plasma substitutes, the fluorocarbon emulsion is capable of carrying three times as much oxygen. In comparison with real blood, the substitute is said to have the advantage that the size of the emulsion's particles is 1/50 to 1/70 that of red blood corpuscles, and therefore the substitute is able to get into areas with damaged circulation where red blood corpuscles cannot.

It is reported that at the Institute of Surgery imeni Vishnevskiy, Prof A. Kaydash has used the new fluorocarbon blood substitute in more than 150 operations to implant a heart valve prosthesis. The blood substitute also is said to have prospects for preserving organs for implantation, and for preventing brain damage in resuscitation of patients.

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#### DIAGNOSIS OF HEREDITARY METABOLIC DEFECTS IN PEDIATRIC NEUROLOGY

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA in Russian  
Vol 84, No 10, Oct 84 (manuscript received 28 Jun 83) pp 1458-1461

KRASNOPOL'SKAYA, K. D., LEBEDEVA, T. V., ODINOKOVA, O. N. and YAKOVLEV, S. A.,  
Institute of Medical Genetics (Director, Academician N. P. Bochkov), USSR  
Academy of Medical Sciences, Moscow

[Abstract] A program of selective screening of hereditary metabolic defects (HMD) has been developed in the Laboratory of Biochemical Genetics, Institute of Medical Genetics, USSR Academy of Medical Sciences, for children lagging in mental or physical development, the absolute majority of whom have neurological symptoms. Urine and blood studies are used as the basis of analysis. Anomalies revealed in the screening program are confirmed by further studies including quantitative determination of metabolites in blood and urine, loading tests with determination of endogenous renal clearance of the loaded substance, determination of blood serum lysosomal enzyme activity and other tests. The diagnostic capabilities of the program allow identification of more than 100 nosologic units including hereditary amino aciduria, glycosuria and lysosomal diseases. More than 3000 patients have been screened to date. The diagnosis of HMD in children serves as the basis for medical and genetic consultation for families to prevent birth of additional children with similar defects. In 1969-1970, examination of mentally-retarded patients

in Tula oblast allowed approximate estimation of the frequency of PKU and led to the conclusion of need to organize massive screening for this HMD in the Central European USSR. Population studies in Turkmenia and Uzbekistan showed very low frequency of PKU and high total frequency of mucopolysaccharidosis, the spectrum of which was different in the European and Mongoloid populations. References 10: 8 Russian, 2 Western.

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#### BIOELECTRIC ACTIVITY OF BRAIN DURING ACUTE PERIOD AND CONVALESCENCE OF TICK-BORNE ENCEPHALITIS IN CHILDREN

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA, in Russian Vol 84, No 10, Oct 84 (manuscript received 13 Oct 82) pp 1483-1487

MITROKHINA, L. A., FOMIN, G. I., KUZ'MINA, A. G. and POPOVA, L. O., Department of Nerve Diseases (headed by Professor A. P. Tyerusalimskiy), Novosibirsk Medical Institute

[Abstract] A study was made of the specifics of bioelectric activity of the brain in children during the acute period of TBE as well as in the period of convalescence, and correlated with clinical forms and courses of the disease. Eighty-six children, 3 to 15 years of age were involved, primarily with latent forms of the disease and meningeal syndrome. In all, 183 EEGs were recorded, 153 in children with latent forms of the disease, 22 in children with meningeal syndrome, 8 in patients with meningoencephalitic syndrome, 1 in a child with the progradient form, Kozhevnikov epilepsy. Analysis of the EEG showed that changes in biopotentials of the brain are expressed as disorganization of alpha activity in children of the oldest age group, appearance of  $\Delta$  and  $\theta$  waves, acute waves, spike and polyspike complexes, paroxysmal activity as well as disruptions of cerebral bioelectric activity. In the acute stage of TBE, disruptions of bioelectric activity were usually clearly seen with all three forms of the disease. Rather clear changes in bioelectric activity of the brain are thus observed even with latent forms of TBE, with resultant danger of convulsions. The mediobasal formations of the temporal lobes and reticular formation of the brain stem are also clearly involved at the height of the disease. Figures 2; references 7 (Russian).

[1610-6508]

ACUTE NECROTIC ENCEPHALITIS IN CHILDREN

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA in Russian  
Vol 84, No 10, Oct 84 (manuscript received 14 Jun 83) pp 1487-1493

DEMENT'YEVA, R. K., LESHCHINSKAYA, Ye. V. and MARTYNENKO, I. N., Institute of Poliomyelitis and Viral Encephalitis (director, Corresponding Member of the USSR Academy of Medical Sciences, Professor S. G. Drozdov), USSR Academy of Medical Sciences, Moscow

[Abstract] Many years of study of the etiology of acute encephalitis with necrosis of brain matter, one of the most severe forms of infectious nervous system pathology in children, have established that the most frequent if not only pathogen is type I herpes simplex virus. This article presents clinical and electroencephalographic data obtained in examination of 25 children with diagnosis of acute necrotic encephalitis. The necrotic nature of the process was confirmed in 7 cases by computertized tomography, in 9 as a result of morphologic examination at autopsy. The most massive foci of necrosis were in the temporal lobes of the brain, but also encompassed the frontal-temporal and perietal-occipital areas. In 9 cases the diagnosis was based on clinical data. The patients were 3 months to 13 years of age, most being under 3 years. Children who survived were observed for 1 to 8 years. All surviving patients had clear residual problems, including decerebration, oligophrenic dementia, epileptic syndrome, hemiparesis and aphasia. Comparison of clinical, morphologic and electroencephalographic data from patients with necrotic encephalitis of unknown etiology and necrotic encephalitis caused by type I herpes simplex virus showed no significant differences, indicating the possibility of a single herpetic etiology of the disease. Figures 4; references 15: 2 Russian, 13 Western.

[1610-6508]

MICROBIOLOGY

MICROBIOLOGICAL INDUSTRY NEEDS NEW CONSTRUCTION

Moscow STROITEL'NAYA GAZETA in Russian 16 Nov 84 p 3

[Interview by G. Dmitriyev of V. Ogarkov, deputy chief of the Main Administration of Microbiological Industry under the USSR Council of Ministers: "The Industry of 'Miracles.' More Rapidly Constructing Projects of the Microbiological Industry."]

[Text] About 20 years ago, a new sector of the economy appeared in our midst--the microbiological industry. It is providing a valuable input--feed yeasts, amino acids, enzymes, compounds for plant protection, and much, much more. Microbiology is participating actively in implementing the USSR Food Program and is preparing to make its contribution in realizing the Energy Program. A new source of energy has appeared--biomass.

The way this sector is currently developing is the subject of the conversation of our correspondent and V. Ogarkov, deputy chief of the Main Administration of Microbiological Industry under the USSR Council of Ministers.

[Question] Vsevolod Ivanovich, it is well known that radical changes have taken place in physical-chemical biology in recent decades. And, no doubt, every step forward of this modern science opens up new possibilities for industrial microbiology?

[Answer] Yes, it is being opened up. Above all this means methods worked out successfully by geneticists to construct cultures of microorganisms with previously decided qualities. There has appeared a real possibility of extensive production of practically any biologically active substance--for example, peptides or neuropeptides synthesized by the human brain. This means that in the near future we will be able to get in the drugstore a drug manufactured in a plant of our sector which will make it possible to instantaneously take away a sharp feeling of pain, or rapidly memorize large volumes of information for a long time.

Today the microbiological industry rightly holds a place at the frontier of scientific-technical progress. It is placed in the same rank as atomic

machine building, cosmic and laser technology, and electronics. Products of microbe synthesis and enzyme processes of transforming substances are bringing with them much that is new and extremely useful to the entire economy of our country. The newest technology is being created, of a kind which did not exist before. In short, we're talking about creating an industry of "miracles."

[Question] Couldn't you give some examples?

[Answer] You probably know how great are the wastes of metallurgical enterprises. They amount to millions of tons of slag. But they contain a vast quantity of ferrous and rare metals. Suspensions of certain microbe cultures can separate cobalt, copper, and other components from the poor ores and worthless materials. Solutions of these pure metals are derived from equipment for enzyme processing of slag without complex metallurgical processes.

Microbes can also appear in the role of cook, physician, and even fireman. They have a multitude of professions.

[Question] Are there ones for construction?

[Answer] I think that in the future microbes will be in construction as well. There is a tempting prospect for using yeast proteins. Who does not know that in the distant past, in laying the walls of fortresses, palaces, and cathedrals, the stones were solidly fastened with a solution containing ordinary egg whites. Our bacterial solution has similar properties. That's how we made up our mind to use it in the same capacity.

[Question] You said that the sector can already produce unique lubricants, varnishes, packaging films, food products, and medical compounds. The demand for them is vast. How can the demands be satisfied in practice?

[Answer] There is only one way out--to create the necessary production capacities. Much here depends on the builders. They, unfortunately, do not always give the necessary attention to the needs of the microbiological industry. Let me cite an example. Seven years ago a technical design was prepared for the construction of an experimental-industrial installation intended for manufacturing furyl resins, glycerides, fatty acids, and also the latest medicines. According to our calculations, it will yield for the state more than 4 million rubles of pure profit every year, plus substantial economizing on foreign currency. In short, a necessary and important installation which, incidentally, will largely determine the future of physical-chemical biology as well. Nevertheless, for 6 years now it has been impossible to build it. We are glad that the USSR Ministry of Construction included the project in the plan of contract projects for this year. But, unfortunately, so far not one kopeck has been spent.

#### Editorial Note

In connection with the last phrase of the interview, the question "Why?" is reasonable.

"We do not have enough production capacities," said Yu. Kashitsin, chief engineer of Glavvolgovyatskstroy Trust No 5.

"The trust plan is really overloaded," confirmed A. Vekshin, chief of the USSR Ministry of Construction Main Administration of Plan Economics.

A familiar argument. It comes forward every time, like a shield, as soon as the conversation turns to a project which is unprofitable for the contractor. In this case the unique construction was included in the plan of his work. And no references to overloading can obscure the sad fact that Trust No 5, plainly speaking, is disrupting the construction of a project whose completion is awaited impatiently. We suggest that USSR Deputy Minister of Construction A. Yakovlev, to whom the trust is subordinate, turn his attention to the alarming situation which has developed.

In future years, new production capacities should be created in the microbiological industry. The volume of capital outlays in the 12th Five-Year Plan is approximately tripled. This means that contracting organizations must now start turning toward projects of microbiology.

12255  
CSO: 1840/1020

UDC: 579.873.71.25

PROTOPLASTS OF STREPTOMYCES GRISEUS AND ITS AUXOTROPHIC DERIVATIVES

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 5, Sep-Oct 84  
(manuscript received 22 Mar 83) pp 3-8

PODGORSKAYA, M.Ye., STRIZHKOVA, A.M., OSIPCHUK, L.F., BAMBURA, O.I. and  
ZANKOVSKAYA, I.V., Institute of Microbiology and Virology, Ukrainian SSR  
Academy of Sciences, Kiev

[Abstract] The purpose of this work was to develop conditions for highly effective production and stabilization of protoplasts of *S. Griseus*, as well as their regeneration into micelial cells. Spores of the initial cultures were inoculated into test tubes with 10 ml of medium S and grown on a rocking stage for two to three days at 30°C, after which the cultures were allowed to settle and the precipitate was transferred to fresh S medium containing various concentrations of glycine. After eighteen hours of growth the micelia were collected by centrifugation and thrice washed with medium P with various concentrations of saccharose, Mg<sup>2+</sup> and Ca<sup>2+</sup> ions. To determine the capability of *S. Griseus* protoplasts to revert to their initial cell forms, a suspension of purified protoplasts was inoculated into dried soy medium, then semiliquid R2 medium was poured on at 38°C. Incubation occurred at 28°C for ten to fourteen days and colonies were counted. The sensitivity of the protoplasts to osmotic shock was determined. The optimal media for production and regeneration of *S. Griseus* protoplasts forming streptomycin are modified Okanishi medium with 20 mM MgCl<sub>2</sub>, 30 mM CaCl<sub>2</sub> and 0.3 M saccharose as osmotic stabilizer. References 11: 3 Russian, 8 Western.

[111-6508]

UDC: 579.69.620.193.8

BIOLOGICAL FOULING OF ETHYLENE PRODUCTION WATER RECYCLING SYSTEM

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 5, Sep-Oct 84  
(manuscript received 31 Jan 83) pp 24-28

KURDISH, I.K., KHENKINA, L.M. and PAVLENKO, N.I., Department of Petrochemistry,  
Institute of Physical and Organic Chemistry and Coal Chemistry, Ukrainian  
SSR Academy of Sciences, Kiev

[Abstract] A study was made of biotic factors determining the intensity of biological overgrowth of ethylene as well as the distribution of sulfate-reducing bacteria in the system. The total quantity of microorganisms was determined by counting on membrane filters. The content of heterotrophic aerobic and anaerobic microorganisms was determined by inoculating specimens on meat-peptone agar and wort agar. The resistance of the microflora in the water supply system to high temperatures was studied by exposure of the specimens to various temperatures for one hour. The results indicated presence of large quantities of a number of biogenous substances in the water, including compounds of phosphorus and carbon. Large numbers of both aerobic and anaerobic microorganisms were present, consuming the oxygen absorbed by the water in the cooling tower, creating favorable conditions for development of both aerobic and anaerobic microorganisms. The sulfate-reducing bacteria present caused accumulation of hydrogen sulfide in the system, increasing corrosion. One possible means of controlling the fouling organisms might be to heat the water. Heating to 60°C for sixty minutes significantly reduces the microorganism population, while 70°C results in almost total elimination. Figures 4; references 8 (Russian).

[111-6508]

UDC: 582.288-119

INFLUENCE OF CERTAIN MYCOTOXINS ON ACTIVITY OF CARBOHYDRATE METABOLISM ENZYMES  
IN DENDRODOCHIUM TOXICUM

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 5, Sep-Oct 84  
(manuscript received 6 Apr 83) pp 38-42

ZAYCHENKO, A.M. and BOGOMOLOVA, L.A., Institute of Microbiology and Virology,  
Ukrainian SSR Academy of Sciences, Kiev

[Abstract] The authors have previously reported the variation in metabolic processes in dendrodochium toxicum Pidopl. et Bilai as a function of the content of dendrodochins in the medium, and the possible regulatory role of these substances. To provide a deeper study of this problem, an attempt was made to investigate the influence of metabolites formed by this fungus as well as a number of other mycotoxins on the activity of certain carbohydrate metabolism enzymes. The fungi were grown by a deep method under standard

conditions. The activity of the enzymes was determined by spectrophotometric methods. The enzymes of glycolysis are less subject to inhibition by the mycotoxins than are isocitrate dehydrogenase and succinate dehydrogenase. The mycotoxins formed by *D. toxicum* suppressed the activity of the glycolysis enzymes only at high concentrations. Low concentrations of these mycotoxins have an activating effect on the enzymes. Lactate dehydrogenase is, however, highly sensitive to the trichotecenes. Glucoso-6-phosphate dehydrogenase is suppressed by high concentrations of verrucarin A and roridine A, but the other trichotecenes do not influence the activity of the enzyme. The dehydrogenases of the tricarboxylic acid cycle are particularly sensitive to trichotecene mycotoxins. Fusaric acid has an inhibiting effect on all the enzymes studied, proportional to the concentration of the mycotoxin and most effective against alcohol dehydrogenase and glucoso-6-phosphate dehydrogenase. Patulin does not influence the activity of phosphofructokinase but does inhibit aldolase, alcohol dehydrogenase and lactate dehydrogenase as well as the tricarboxylic acid cycle enzymes. References 21: 12 Russian, 9 Western.  
[111-6508]

UDC: 579.841.42.25

#### PLASMIDS OF OBLIGATE AND FACULTATIVE GASEOUS HYDROCARBON-UTILIZING BACTERIA

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 5, Sep-Oct 84  
(manuscript received 11 Nov 83) pp 70-72

ROMANOVSKAYA, V.A., STOLYAR, S.M. and PINCHUK, G.E., Institute of Microbiology and Virology, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Obligate methane-utilizing and facultative ethane-utilizing bacteria were screened for the presence of plasmids for purposes of further utilization as vectors for the transfer of genetic information and factors mobilizing chromosomes. Thirty strains of methane-utilizing bacteria were studied for the presence of plasmid DNA. Only one species, *methyllococcus luteus*, was found to have three bands of extra chromosomal DNA. Plasmids with molecular masses of about fifty and forty Mdaltons were found in two strains of *Rh. opacus*, capable of utilizing organic compounds including ethane, propane and butane but not methane when grown on complex organic media. Under certain growth conditions, the *Rh. opacus* lose their ability to grow on ethane. It is suggested that the genetic determinants for utilization of ethane are located in the plasmid DNA. Figures 2; references 8: 1 Russian, 7 Western.  
[111-6508]

UDC: 579.834.115.083.3

## LEPTOSPIRE HEMOSENSITINS OBTAINED BY BALLISTIC DISINTEGRATION

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 5, Sep-Oct 84  
(manuscript received 31 Jan 83) pp 80-85

MATSYUK, V.M. and NAZAROVA, O.G., Institute of Microbiology and Virology,  
Ukrainian SSR Academy of Sciences, Kiev; Kiev Scientific Research Institute  
of Epidemiology and Infectious Diseases

[Abstract] A method was sought to extract native antigens for subsequent use in the passive hemagglutination reaction. The method of ballistic disintegration was found to be suitable because of its simplicity, gentle effect on the cell and its ingredients and absence of any chemical components introduced in the reaction which might indirectly influence the course of subsequent reactions. Three series of antigens were obtained from leptospires of strains Akijami A and Van Tienen. The disintegration method produced a high yield of preparations, 8-10% of dry biomass with high protein content, low sugar content and low nucleic acid content. The hemosensitins manifested high serologic activity in passive hemagglutination. Figure 1; references 23:

11 Russian, 12 Western.

[111-6508]

UDC: 578.826.1.112

## EARLY ADENOVIRUS PROTEINS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 5, Sep-Oct 84  
(manuscript received 14 Jun 83) pp 88-100

TARASISHIN, L.A., Institute of Microbiology and Virology, Ukrainian SSR  
Academy of Sciences, Kiev

[Abstract] A study was made of the specifics of organization and transcription of early areas of the adenovirus genome and various virus-specific proteins described. The adenovirus genome is a double spiral linear DNA molecule with a molecular mass of  $10-25 \cdot 10^6$  daltons. At the present time the attention of investigators is concentrated on the left end of the r thread. The early area of the adenovirus genome E2 codes two proteins (72 and 55) which participate in the replication of the viral DNA. One of these, DNA-binding protein or DBP, has a molecular weight of 72,000-73,000 daltons in human adenovirus type 2 and type 5, 60,000-63,000 daltons in human adenovirus type 12. The participation of DBP and the terminal protein in the replication of viral DNA has been proven, but many specifics in this process are not yet clear. The descriptive phase of study of early adenovirus proteins has now been completed. The protein products of all early genes of the adenoviruses have been basically determined. Researchers are now working on the functions of the early proteins and the mechanisms of their action,

knowledge of which will be significant not only for an understanding of the specifics of reproduction of adenoviruses, but also for cellular biology in general. References 79: 2 Russian, 77 Western.

[111-6508]

UDC 614.48

QUANTITATIVE ASSESSMENT OF INTENSITY OF PROCESSES OF DIEING OFF OF MICROORGANISMS UNDER EFFECT OF DISINFECTANTS

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 84 (manuscript received 8 May 84) pp 33-36

BURTOVOY, S.P., CHIKISHEVA, T.V. and BOLOTOV, V.D.

[Abstract] Experimental checking and substantiation of a simple quantitative approach to assessment of processes of dieing-off of microorganisms after application of disinfectants were described and discussed. The procedure includes calculation of the mean rate of destruction of the microorganisms, compilation of a linear, analytical model and quantitative assessments of deviations of experimental data from calculated data with the aid of a non-dimensional parameter. Applicability of the method was demonstrated experimentally in a study of the bactericidal effect of the preparation dezam on St. aureus (strain No. 906). The method was found to be superior to the method of least squares as applied to specific experimental data. Figure 1; references 5 (Russian).

[1683-2791]

UDC 576.8

CLOSTRIDIUM PERFRINGENS SPORULATION UNDER DIFFERENT pH OF CULTURE MEDIUM

Moscow IZVESTIY AKADEMII NAUK SSSR; SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 84 (manuscript received 20 Apr 84) pp 865-873

SINYAK, K.M. and VOLKOVA, V.P., Kiev State Institute for Advanced Training of Physicians, Kiev

[Abstract] A toxigenic strain of Cl. perfringens type A was used to determine the role of hydrogen and hydroxyl ion concentrations in a culture medium during vegetation and sporulation of this pathogen. Acid and slightly acid reaction of the medium (pH 4.7-6.5) did not prevent vegetation growth but did inhibit formation of heat-resistant spores in this microorganism. Active sporulation occurred only on neutral and alkaline media. The Cl. perfringens growth curve increased sharply at the beginning of the exponential phase while the growth rate decreased in the middle and end phases and stopped after 6-8 hours of cultivation. Data obtained fully confirmed

the mechanisms of action of the acid-alkaline potential on sporulation and thus on the capacity of some pathogenic organisms to survive in soil for a long time. Figures 6; references 14: 4 Russian, 10 Western.  
[1682-2791]

UDC 577.154.34

#### LEVAN SYNTHESIS BY LEVAN-SUCRASE OF GLUCONOBACTER OXYDANS

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGOYA in Russian Vol 20, No 6, Dec 84 (manuscript received 17 Feb 83) pp 773-779

ELISASHVILI, V.I., Leningrad State University

[Abstract] Studies with levan-sucrase (EC 2.4.1.10) showed that the enzyme isolated from *Gluconobacter oxydans* was capable of synthesizing two types of levan: a high MW product representing a polysaccharide and 65% of the yield, and a low MW fraction consisting of an oligosaccharide. Gel filtration studies on Sepharose 2B indicated that the MW of the high MW fraction was in the vicinity of  $10^7$  daltons. The relative yields of the high and low MW fractions were controlled by the synthesis conditions employed in 0.5 M phosphate/citrate buffer. Synthesis of the high MW fraction was favored by a temperature of less than 30°C, low concentrations of sucrose and levan-sucrase, and a pH range of 3.4-5.3. Figures 3; references 28: 6 Russian, 22 Western.

[1717-12172]

UDC 576.8

#### QUANTITATIVE ASSAYS OF ENTEROBACTERIA AND CLOSTRIDIA IN YEAST PRODUCTION

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGOYA in Russian Vol 20, No 6, Dec 84 (manuscript received 2 Jan 83) pp 836-841

GRIGOR'YEVA, N.A., SHUBINA, L.N., GRADOVA, N.B., ZIKINA, A.I.. and ROGACHEVA, R.A., All-Union Scientific Research Institute of Protein Biosynthesis, Moscow

[Abstract] Various media were tested for suitability in quantitative assays for enterobacteria and clostridia in yeast production technology. Best results in the isolation and assay of enterobacteria were obtained with Endo's medium supplemented with phenol, fuchsin, ethanol and nystatin. For the monitoring of clostridia the optimum approach was found to consist of preliminary pasteurization of the samples, and subsequent inoculation of Wilson-Blair tubes. References 18: 14 Russian, 4 Western.  
[1717-12172]

UDC: 532.4.01/08

ANTIGEN PROPERTIES OF PHYTOPATHOGENIC FUNGI AND THEIR SIGNIFICANCE IN INTER-  
RELATIONSHIPS WITH HOST PLANTS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 98, No 5, Sep-Oct 84  
pp 283-291

PROTSENKO, M.A., Institute of Biochemistry imeni A. M. Bakh, USSR Academy of  
Sciences, Moscow

[Abstract] This is a review-type article. An important area of immunochemical research of phytopathogenic fungi is devoted to determination of differences between pathogenic and nonpathogenic species. Antisera to the fungus *Polyporus tomentosus* obtained from rabbits permitted it to be distinguished from other fungi both in plants and in the soil. Antigen-active substances in fungi have also been distinguished by gel immunodiffusion. This method has been used to find antigens allowing differentiation of three species of *Cronartium*. The use of cross adsorption of sera allowed *Trametes versicolor* to be distinguished from other species. The method of double gel immunodiffusion allows differentiation of species in the genera *Pythium* and *Phytophthora*. A few recently published works allow judgment to be made concerning the chemical nature of the antigen-active substances in fungi. Various immunochemical methods based on different materials have shown the presence of phytopathogenic fungi of antigen-active substances allowing description of individual species, sometimes even races of fungi. In most cases organisms, which are particularly difficult to differentiate, contain a certain number of similar antigens. Cross adsorption allows determination of antigens specific for individual species, sometimes strains of fungi. Immunochemical methods can also determine antigens common for fungi and host plants. References 66:  
22 Russian, 44 Western.

[1618-6508]

MOLECULAR BIOLOGY

UDC 577.217

BONDING OF YEAST PHENYLALANINE tRNA WITH RIBOSOMES OF ESCHERICHIA COLI.  
EFFECT OF REMOVAL OF MODIFIED BASE ADJACENT TO 3'-SIDE OF ANTICODON ON CODON-  
ANTICODON INTERACTION

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 6, Nov-Dec 84 (manu-  
script received 10 Apr 83) pp 1486-1496

KATUNIN, V.I. and KIRILLOV, S. V., Leningrad Institute of Nuclear Physics  
imeni B. P. Konstantinov, USSR Academy of Sciences, Gatchina, Leningrad Oblast

[Abstract] Interaction of the anticodon of transport RNA (tRNA) and the codon of matrix RNA, a central process of protein synthesis, is closely related to the modified nucleotide located adjacent to the 3'-side of the anticodon. The present article reports on quantitative study of the reactions of various forms of aminoacyl-tRNA and peptidyl-tRNA with the P-component of the complex 70S ribosome+poly (U), and the role of the Y-base in this reaction. Enrichment fractionalization and purification followed previous practices. After the Y-base was removed, the tRNA was treated with aminoacyl and enriched again on DEAE cellulose that had been treated with benzoyl. Precise information on the actual distribution of tRNA was obtained; it helped determine that 70S ribosomes from *E. coli* were capable of binding two molecules, phe-tRNAPhe<sup>+Y</sup> and Phe-tRNAPhe<sup>-Y</sup>. The former's behavior in tests with 30S sub-particles and 70S ribosomes from *E. coli* was found to be very similar to that of Phe-tRNA. Energy differences were slight. In the absence of poly(U), the affinity of N-acetyl-Phe-tRNAPhe<sup>-Y</sup> to the P-component was 20 times less than with the positive variant. Removal of the Y-base had no effect on interaction enthalpy or magnesium concentration. Figures 8; references 34: 4 Russian, 30 Western.

[1654-12131]

UDC 577.32.4

REACTION OF IMMOBILIZED DNA WITH IONS OF ALKALINE METALS AND AMMONIUM

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 6, Nov-Dec 84  
(manuscript received 18 Oct 83) pp 1583-1589

KUZNETSOV, I. A., KARGOV, S. I. and KOZLOV, A. G., Chemical Faculty,  
Moscow State University imeni M. V. Lomonosov

[Abstract] This article continues reports on study of ion selectivity of DNA by an ion exchange method used to determine the whole range of alkaline metals and ammonium according to their degree of bonding with immobilized DNA. High-molecular sodium salt DNA from chick erythrocytes were immobilized in a polyacrylamide gel. Concentration of alkaline metals in eluate was determined by flame photometry, and ammonium concentration by a formaldehyde method. Results indicated that while ions  $\text{Cs}^+$ ,  $\text{Rb}^+$  and  $\text{K}^+$  differed markedly, the differences between  $\text{Li}^+$ ,  $\text{Cs}^+$  and  $\text{NH}_4^+$  were much less and thus it was difficult to place them in the order of bonding magnitude. Thus the order of bonding of alkaline metal ions and ammonium with immobilized DNA is  $\text{Li}^+ \geq \text{NH}_4^+ \geq \text{Cs}^+ > \text{Rb}^+ > \text{K}^+ \geq \text{Na}^+$ . This order does not coincide with that for sulfoxylic cationites or phosphoroxylic cationites and polyphosphates. A temporary reduction in volume of the test columns was explained on the basis of reactions of  $\text{Li}^+$  with DNA that formed structures which were not washed off by dissolved solutions of alkaline metal salts. The  $\text{NH}_4^+$  ion was determined to undergo a special reaction with DNA under certain circumstances.

Figures 4; references 20: 14 Russian, 6 Western.  
[1654-12131]

UDC 575.313

RESTRICTION REDUCTION OF ecoK DNA OF BACTERIOPHAGE LAMBDA IN PRESENCE OF PLASMID pKM101 ard<sup>+</sup>. GENERAL CHARACTERIZATION AND GENETIC LOCALIZATION OF ard GENE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 6, Nov-Dec 84 (manuscript received 20 Oct 83) pp 1590-1596

ZAVIL'GELSKIY, G. B., MERSHAVKA, V. Yu., YUSIFOV, T.N. and BELOGUROV, A. A., Institute of Molecular Biology, USSR Academy of Sciences, Moscow; All-Union Cardiological Scientific Center, USSR Academy of Medical Sciences, Moscow

[Abstract] The multiplication of the unmodified lambda.0 bacteriophage in *E. coli* K12 cells is apparently enhanced by the effects of class I ecoK restriction. The present article reports on localization of transposon Tn5 in DNA pKM101 which destroys the capacity of the plasmid to weaken EcoK restriction. The plasmid restriction area was labeled ard for "alleviation of restriction of DNA." Features of this phenomenon were studied by analysis of bacteria, in particular *E. coli* strains, of bacteriophages, and of

production of insertion mutants of the pKM101, plasmid isolation and restriction analysis. Data show the differences between the plasmid and bacterial systems of DNA restriction alleviation. Results indicated that virulent bacteriophages have special genes whose products are restriction enzymes inhibitors. The ard gene was determined to be a specific EcoK methylase, which did not enhance the process of specific methylation of DNA. As did the gene of the lambda phage of lambda. Figures 2; references 18: 1 Russian, 17 Western. [1654-12131]

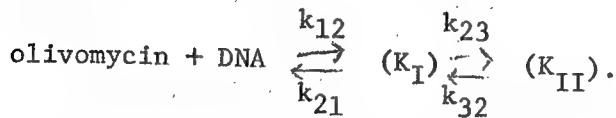
UDC 577.323.23

## STEREOCHEMISTRY AND KINETICS OF INTERACTION OF DNA AND ANTITUMOR ANTIBIOTIC OLIVOMYCIN

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 6, Nov-Dec 84  
(manuscript received 10 Nov 83) pp 1606-1616

BRIKENSHEY, V. Kh., PITINA, L.R., BARENBOYM, G. M. and GURSKIY, G. V., Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna, Moscow Oblast; Institute of Molecular Biology, USSR Academy of Sciences, Moscow

[Abstract] Olivomycin, an antibiotic of the aureolic acid group, is used in tumor control due to its ability to react selectively with DNA. The present article reports on study of the kinetics of complex formation in this interaction by a checked flow method, upon which a model of the complexes formed was constructed. Experiments were conducted in 0.01 molecular weight of tri-HCl buffer at pH 7.5, with purified magnesium chloride and distilled water for added purity. Absorption and fluorescence were measured in an interval of 220-700 nm. Concentration measurements were conducted in an extreme excess of DNA phosphates compared to olivomycin and with balanced ratios. The hypothesis on screening of antibiotic chromophores was confirmed by the results of measuring polarization of the DNA-olivomycin complex. Experimental data are explained by the mechanism of a formula covering two succeeding reactions:



Identification of two periods of relaxation from kinetic measurements and agreement between kinetic and balancing experiments suggested that the share of olivomycin in a hypothetical third form does not exceed a few percent, while complex formation appeared to follow two different directions. The structure of the olivomycin chelate and DNA showed great similarity to that of an actinomycin-DNA complex. Figures 8; references 31: 16 Russian, 15 Western.

[1654-12131]

UDC 577.323.55

STUDY OF STRUCTURAL ORGANIZATION OF RNA OF MS2 PHAGE USING FLUORESCING DYES

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 18, No 6, Nov-Dec 84 (manuscript received 5 Nov 83) pp 1617-1624

BORISOVA, O. F., GRECHKO, V. V., ALESHKINA, L. A. and KUZNETSOVA, N. V., Institute of Molecular Biology, USSR Academy of Sciences, Moscow

[Abstract] Secondary and tertiary RNA structures predictably play major roles in RNA functions. Earlier studies have shown the spatial organization of tRNA and other low-molecular RNAs, such as the ss- and ds-segments of the MS2 phage that contain 3659 nucleotides and are accessible to S1 and SV nucleases. The present study reports on their accessibility to EtBr dyes and acridine orange, and their role in stabilizing the tertiary structure of RNA. Phenol deproteinization was used to isolate RNA from the MS2 phage. Isotherms of adsorption, equipment used, and determination of monomer and dimer AO concentrations adsorbed on RNA, are summarized. The number of double- and single-strand segments of the RNA of the MS2 phage form strong and weak complexes, respectively. About half of the double-strand segments were inaccessible to either dye. Without Zn<sup>2+</sup> ions, acridine orange adsorbed on DNA only in the monomer form. A hypothetical model of the spatial ordering of ss- and ds-segments into the tertiary structure of MS2-phage RNA is formed of ds-segments, which are so closely packed that about half are inaccessible to the dyes.

Figures 4; references 16: 10 Russian, 6 Western.

[1654-12131]

UDC: 577.217.32

MONOCLONAL ANTIBODIES TO TRYPTOPHANYL tRNA SYNTHETASE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 5, Sep-Oct 84 (manuscript received 29 Dec 83) pp 1407-1411

BERESTEN', S. F., ZARGAROVA, T.A., KOSTROV, S.V. and FAVOROVA, O.O., Institute of Molecular Biology, USSR Academy of Sciences, Moscow

[Abstract] A description is presented of the process of producing two lines of hybrid cells (hybridomas) by monoclonal antibodies to tryptophanyl tRNA synthetase and some of the characteristics of these antibodies are presented. Testing of the first population of hybrid cells and subsequent cloning produced two hybrid clones called Am1 and Am2, secreting IgG1, κ antibodies. Bonding of Am1 and Am2 with tryptophanyl-tRNA-synthetase was analyzed by a radioimmunological method. In the case of Am2, over 90% of the radioactivity specifically bonded with the TRS sorbent; the value for Am1 was not over 50%. Am2 inhibited the activity of tryptophanyl tRNA synthetase in the first stage of the reaction, while bonding of Am1 did not lead to inactivation of the enzyme. The degree of inhibition of metabolism by Am2 did not change

significantly over the concentration range of 50 to 200 nM. Addition of Aml did not influence the inhibition of Am2. Figures 3; references 12: 4 Russian, 8 Western.  
[128-6508]

UDC: 577.34

#### tRNA-BONDING CENTERS OF ESCHERICHIA COLI RIBOSOMES AND THEIR STRUCTURAL ORGANIZATION

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 5, Sep-Oct 84 (manuscript received 14 Nov 83) pp 1194-1207

KARPOVA, G. G., Novosibirsk Institute of Organic Chemistry, Siberian Department, USSR Academy of Sciences, Novosibirsk

[Abstract] Results are presented from a study of the structural organization of tRNA-bonding centers of Escherichia coli ribosomes. Problems of the number of tRNA bonding sectors on the ribosome, conservation of codon-anticodon interaction at P-sites and the participation of tRNA interacting with the ribosome are also discussed. The bacterial ribosome has been found to contain two functionally different, non-overlapping tRNA-binding sites located at subparticle 30S; the P and A sites. It is shown that the process of bonding of aminoacyl-tRNA at the A site has two stages. Recent data have shown that a codon-anticodon interaction occurs at the P site. An anticodon loop and C groups at positions 74 and 75 interact with the ribosome at the A site and particularly at the P site. The three-dimensional structure of the tRNA bonded at the A and P sites differs from native tRNA: there is no interaction between T and D loops. The process of transpeptidation is probably accompanied by conformational restructuring of the ribosome. All proteins modified in subparticle 50S except protein L8 have been found to be components of the peptide transferase center. Figures 6; references 65: 5 Russian, 60 Western.

[128-6508]

UDC: 577.217.333:577.217.335

#### PRIMARY AND THREE-DIMENSIONAL STRUCTURE OF tRNA

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 5, Sep-Oct 84 (manuscript received 14 Feb 83) pp 1233-1248

TUKALO, M.A., Institute of Molecular Biology and Genetics, Ukrainian Academy of Sciences, Kiev

[Abstract] A review is presented of methods used at the present time to study the primary structure of tRNA. Methods involving introduction of a label to a

polynucleotide *in vitro* are primarily used. Three main methods are used to obtain end-labelled tRNA: introduction of  $^{32}\text{P}$  with polynucleotidokinase T4 and [ $\gamma$ - $^{32}\text{P}$ ]ATP at the 5' end of tRNA or oligonucleotides; tRNA-nucleotidyl transferase and [ $\alpha$ - $^{32}\text{P}$ ]ATP is used to label the 3' end; as is RNA-ligase and [ $5'$ - $^{32}\text{P}$ ]pCp. More than 300 nucleotide sequences of tRNA are now known. Rules are presented for construction of the structure. The structure of initiator and elongator tRNA is discussed. The specifics of the structure of tRNA from the mitochondria of higher eukaryotes are outlined. Studies of the three-dimensional structure of tRNA in solutions and crystals are described. Chemical modification methods allow the production of information on the state of heterocyclic bases and phosphoric acid groups in the ribose-phosphate skeleton of tRNA. Ribose groups are the only structural element of the molecule for which methods of study have not yet been developed. Figures 5; references 98: 14 Russian, 84 Western.

[128-6508]

UDC: 577.217.32

#### MECHANISM OF FUNCTIONING OF AMINOACYL-tRNA-SYNTETASES

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 5, Sep-Oct 84 (manuscript received 31 Jan 84) pp 1264-1286

MALYGIN, E.G. and KISELEV, L.L., All-Union Scientific Research Institute of Molecular Biology, Kol'tsovo Novosibirsk Oblast; Institute of Molecular Biology, USSR Academy of Sciences, Moscow

[Abstract] A review is presented of the kinetic or staged mechanism of reactions catalyzed by ARSase, which can be defined as a combination of enzymes and enzyme-substrate forms, as well as the stages of their transformation supporting the formation of reaction products from the initial substrates. Simple approaches are shown to be insufficient for determination of the sequence of attachment of substrates to the enzyme. Knowledge of the mechanism of action of aminoacyl tRNA-synthetase does not as yet allow a precise boundary to be drawn between common and particular properties, making their enzymatic portrait somewhat blurred. The authors suggest that the general rules concerning their structure and mechanism of action will probably be found at a higher level of organization of the catalytic system, where the interactions between centers may be important, defining the sequence of conformational conversions supporting the mutual adaptation of enzyme and substrate structures and thus the formation of kinetically competent complexes. The study of enzymes participating in the storage, transmission and implementation of genetic information has become an independent area, genetic enzymology. Further intensive and comprehensive studies of ARSase are necessary for further development of molecular biology and genetics as well as the study of biological catalysis. Figures 4, references 137: 18 Russian, 119 Western.

[128-6508]

ADHESIN FACTOR FROM ANIMAL AND HUMAN SERUM

Moscow ZHURNAL OБSHCHEY BIOLOGII in Russian Vol 45, No 3, May-Jun 84  
(manuscript received 17 Nov 82) pp 373-382

YAMSKOVA, V. P. and REZNIKOVA, M. M., Scientific Research Institute of Biological Testing of Chemical Compounds, Moscow Oblast

[Abstract] Biological functions and chemical composition of a serum adhesion factor called adhesin were studied on material extracted from sera of adult rats, dogs, horses and humans, as well as from chick and cattle embryos. Experimental results indicated that a factor does exist facilitating intensified intercellular adhesion. In adult subjects it was found in an inactive state, while in embryos adhesin was active. In spite of this difference, it appeared to be the same material. In contrast to tissue-specific, adhesion-factor contactin, adhesin showed no specificity in its effect on cell adhesion. An assumption was expressed that adhesin acted via the Ca-independent adhesion mechanism because no effect was observed of Ca, Mg, K, Na or Cl ions on preservation of its biological activity. In contrast to contactin, adhesin exhibited biological activity after lyophilization and after dialysis against distilled water. Adhesin appeared to be a glycoconjugate capable of forming high polymer associates without biological activity. The fact that, in embryos, adhesin is found in active state indicates that it participates in embryogenesis processes during formation of complex morphologic structures and cellular differentiation. Figure 1; references 35: 8 Russian, 27 Western. [1680-7813]

NONIONIZING ELECTROMAGNETIC RADIATION EFFECTS

UDC: 579.861.2:615.332.538.5

INFLUENCE OF MAGNETIC FIELD ON SENSITIVITY OF STAPHYLOCOCCUS CULTURE TO ANTIBIOTICS

Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 46, No 5, Sep-Oct 84 (manuscript received 10 Feb 83) pp 74-76

OZINKOVSKIY, V.V. and FAL', N.I., Kiev Scientific Research Institute of Otolaryngology.

[Abstract] A study is presented of the possibility of increasing the sensitivity of a staphylococcus culture to penicillin, erythromycin, streptomycin and tetracycline by acting on the culture with pulsating and constant magnetic fields. The pulsating magnetic field was generated by a 50Hz device consisting of an electromagnet with an open O-shaped core and two diodes converting the alternating current to pulsating dc. Three series of experiments were performed with exposure to magnetic fields of 16 days, 7 days and 1 day. No changes in the morphology of the staphylococci, their catalase, peroxidase, hemolytic or plasma coagulating activity were found in any of the experiments. The sensitivity of the cultures to antibiotics was increased only by exposure for 1 and 7 days to a constant magnetic field. Brief exposure to a pulsating magnetic field had no influence on sensitivity of the culture to antibiotics. References 10 (Russian).

[111-6508]

UDC: 615.846+612.438

EFFECT OF DECIMETER WAVES ON RELATIVE T-LYMPHOCYTE CONTENT IN LYMPHOID ORGANS

Frunze ZDRAVOOKHRANYENIYE KIRGIZII in Russian No 5, Sep-Oct 84 pp 29-33

YEVSTROPOV, V.M. and ZUL'KARNEYEV, R.A., Laboratory of Immunology, Kirghiz Scientific Research Institute of Health Resort Science and Physical Therapy

[Abstract] A study was made of the dynamics of the quantitative level of regulatory subpopulations of T-lymphocytes in lymphoid organs upon exposure to decimeter waves in the zone of projection of the thymus and thyroid. The

study was performed on 56 adult guinea pigs. The blood and lymphoid organs (thymus, cervical and submaxillary lymph nodes, spleen) were collected one hour after the first, third or fifth procedure, or 1, 2, 3 or 4 weeks after completion of the course of exposure to decimeter microwaves. Microwave flux density was  $80 \text{ mW/cm}^2$ , applied to the anterior surface of the neck. A course consisted of five daily procedures, each ten minutes in length. It was found that decimeter waves applied to the area of the neck caused significant redistribution of T-lymphocytes in the blood and lymphoid organs. 1-time exposure results in a decrease in the relative content of T-lymphocytes in the spleen, an increase in the blood. After three procedures, the level of T-lymphocytes begins to decrease in the thymus, after five--in the blood as well. Over the next four weeks, the relative content of T-lymphocytes in the blood begins to increase, but even at the end of the period of observation the previous normal levels had not been reached. The relative content of theophillin-sensitive and theophillin-resistant T-lymphocytes were studied in order to determine whether the helper or suppressor cells were being emitted into the blood stream. It was found that decimeter waves caused significant redistribution of both theophillin-sensitive and theophillin-resistant T-lymphocytes. However, the relative quantity of T-suppressors in the blood and peripheral lymphoid organs increased, indicating an increase in suppressor potential. Application of decimeter waves to the area of the neck is recommended as a method of increasing the suppressor function of the T-system in allergic and autoimmune disease related to a deficit of the suppressor element of immunoregulation at the T-lymphocyte level.

[1022-6508]

UDC: 614.78+613.168]:621.8.038

#### HYGIENIC STANDARDIZATION OF ELECTROMAGNETIC FIELDS OF RADAR SYSTEMS

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 9 Jan 84) pp. 37-40

DUMANSKIY, Yu.D., IVANOV, D.S., NIKITINA, N.G. and TOMASHEVSKAYA, L.A., Kiev Scientific Research Institute of General and Communal Hygiene imeni A. N. Martseyev

[Abstract] Radars operating in the frequency band above 300 MHz may represent a danger for the population. The applicability of the energy principle of standardization to regulation of electromagnetic fields in populated points is analyzed. Equations are derived for hygienic standardization of exposure to electromagnetic fields based on medical and biological research and the corresponding values of energy flux density created by weather radar systems. The equations confirm the correctness of the principle of differentiating electronic devices according to classes on the basis of the fields which they radiate. The energy approach to standardization in the millimeter-decimeter waveband is generally incorrect, but can be useful in establishing the variation of maximum permissible level as a function of time for individual types of radars. References 3. Russian.

[118-6508]

PHARMACOLOGY AND TOXICOLOGY

UDC 577.391.539.125.5:591.434

STUDY OF RADIOPROTECTIVE PROPERTIES OF SOME ORIENTED-SYNTHESIZED COMPOUNDS

Baku IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR: SERIYA BIOLOGICHESKIKH  
NAUK in Russian No 1, 1984 pp 96-101

[Article by T.V. Aliyev, R.A. Babayev and M.I. Dzhabarov, Physiology Institute,  
Azerbaijan State University imeni S.M. Kirov, under the rubric: "Physiology  
of Man and Animals"]

[Text] The purpose of these studies was to find the most effective radioprotective preparations among the numerous directed-synthesis selenium compounds.

Survival percentage rate and mean life span were shown with the experimental material, as well as the peripheral blood status of animals, which received various compounds containing selenium in association with ionizing radiation.

Recently, a number of polyfunctional organic selenium compounds, characterized by less toxicity and greater efficacy compared to inorganic selenium compounds, has been synthesized. These substances are also characterized by high pharmacological activity, capacity to normalize changes in the cell membrane apparatus in a number of pathologies, as well as feasibility of their use as preparations which inhibit development of pathological processes in carcinogenesis and radiation damage.

It was established that with some pathological states, such as dystrophic damage of the organs and tissues, toxic hepatitis and damage to the body with ionizing radiation and aging, the lipid oxidation processes proceed intensively; and, this leads to damage of the physicochemical structure of the plasmatic cell membranes and the subskeletal organelles [5]. In all these states, the selenium compounds display significant antioxidant activity, preventing changes in the cell membranes and, thereby, preserving the viability of the cells [3, 10, 11].

Further studies in this plan are of interest for choosing preparations which work more efficiently and selectively, from the many newly-synthesized selenium compounds. In this connection, of definite interest are newly synthesized substances--selenium semicarbazide, the hydrochloride of 1-phenyl-selenium-4-phenyl-4-hexamethylene iminobutyn-2, phenyl selenium-2-phenylbutyn-2-tetrahydro-1,4-oxazine hydrochloride, phenylseleniumpropanol-2-cyclohexamine hydrochloride, and selenium semicarbazone oleic acid, the radioactive properties of which we have examined.

A.A. Purkan tested four compounds, produced at the Pharmaceutical Chemistry Department, Ryazan Medical Institute imeni I.P. Pavlov, for comparison. The selection of these substances involves, primarily, the fact that during preliminary tests some of them proved to be compounds with radioprotective activity.

At the present time, the most satisfactory results in treating malignant neoplasms are known to be obtained with combined treatment--X-ray therapy plus chemotherapy. From this viewpoint, the identification of the radioprotective properties of directed-synthesis compounds is extremely important in treating malignant neoplasms because, with the absence of adequately-reliable radio-protectors, it is not possible to expose a localized neoplasm to irradiation without injuring the whole body.

Compounds whose synthesis was directed to a selected structure and which contain selenium in their composition, were investigated in this study.

First of all, the experiments were conducted to identify the optimal nontoxic doses of the tested compounds. After finding the optimal doses, studies were conducted to identify the radioprotective properties. In the experiments, 123 nonpedigree male white rats weighing 180-200 g were used. The animals were divided into 12 groups with 10 specimens in each.

Single-dose total irradiation of animals was conducted on a RUM-17 apparatus under the following conditions: voltage--180 kv, current intensity--15 mA, skin-focal distance--30 cm without a focusing barrel, filter--0.5 cm Cu+1 mm Al, dose rate--0.86 g/min, total irradiation dose--6.9 g.

Forty minutes before irradiation, the animals of each group (10th group--control) were administered, intra-abdominally, the test compounds, indicated in Table 1. Efficacy of the studied preparations was determined by the percentage rate of animals surviving to the 30th day and by the mean life span. All the presented data were statistically processed [7, 8].

The study results are reflected in the table.

As a result of the conducted studies, it was found that of all the suggested compounds the most significant radioprotective effect was manifested by: selenium semicarbazide and the hydrochloride of 1-phenyl selenium-4-phenyl-hexamethyleneiminobutyn-2.

With the use of selenium semicarbazide, the state of the animals, total weight changes and weight of the liver and spleen were monitored in addition to the radioprotective properties. All the animals that died were autopsied.

All animals in the control group died by the 15th day after irradiation. As far as the experimental group is concerned, a stable radioprotective effect (50 percent protection compared to the control) was exerted by the selenium semicarbazide, administered intra-abdominally to the rats 40 minutes before irradiation in a 6.9 g dose.

Table 1

## Tested Compounds

No.	Name of compound	Chemical formula	Dose used, mg/kg	Survival rate			Mean life span, days	P
				4	5	6		
1	2	3	4	5	6	7	8	
	Control						12,4 ± 0,6	—
1.	Selenium semi-carbazide		4	50	0,001	25,8 ±	0,001	
2.	Hydrochloride-1-phenyl selenium-4-phenyl-4-hexamethylene iminobutyn		195	61	0,02	25,6 ± 1,99	0,01	
3.	Phenyl selenium-4-phenylbutyn-2-tetrahydro-1,4-oxazine hydrochloride		120	20	0,02	24,0 ± 1,7	0,5	
4.	Phenylselenium-propanol-2-cyclohexylamine-hydrochloride		60	30	0,05	24,6 ± 1,04	0,5	
5.	Oleic acid selenium semicarbazide		100	0	—	8,0 ± 1,4	0,01	
6.	8-oxypyridine-9-selenium semicarbazide		40	0	—	15,1 ± 2,17	0,2	
7.	Salt 4-nitrobenzol-1-selenazole-1-hydrazide		25	0	—	11,0 ± 1,71	0,5	
8.	4-oxyseleazole-2-acetoxyphenol-6-diazide		20	0	—	6,9 ± 0,02	0,002	
9.	Oxyselenazole dimethyloxide		35	0	—	14,6 ± 2,03	0,5	

In studying the course of acute radiation sickness, intra-abdominal and even subcutaneous administration of selenium semicarbazide before irradiation moderates the severity of radiation damage and increases the animal survival rate, compared to the control group. Thus, on the third day after irradiation, the mean survival rate of animals in the experimental group was 86.6 percent and in the control--83.3 percent, on the 7th day at the height of radiation damage--66.6 percent and 55.5 percent respectively, and by the 12th day after irradiation--13.3 percent and 10 percent. A positive influence of selenium semicarbazide on the regular elements of the peripheral blood was noted. For example, the number of leukocytes in 1 mm<sup>3</sup> of blood on the 3rd day after irradiation on the average reached up to 1300 in the experimental group and up to 500 in the control group, and on the 7th day--1200 and 450, respectively. For those experimental rats who survived to the 12th day after irradiation, the number of leucocytes in the peripheral blood was 2700, whereas the number for the control group was 1300.

A sufficiently clear positive effect was observed with intra-abdominal administration of selenium semicarbazide one hour after irradiation. On the 7th day, the results obtained for the survival rate of animals were found to be 73.9 percent (control--54.4 percent), and the level of leukocytes in 1 mm<sup>3</sup> of blood rose to 3810 (control--1300). On the 12th day after irradiation, the survival rate was 14.4 percent compared to the control--10 percent.

More convincing data were obtained with simultaneous intra-abdominal and subcutaneous administration of selenium semicarbazide one hour after irradiation of animals. In this case, the survival rate of animals by the 12th day after irradiation was 27.5 percent (control--1 percent). Up to 4810 leukocytes were determined in 1 mm<sup>3</sup> of blood (control--1300). It is essential to note that all the control animals died by the 12th day after irradiation with severe symptoms of acute radiation sickness.

In studying the hydrochloride of 1-phenylselenide-4-phenyl-4-hexamethylene iminobutyn-2, it was found that, with intraabdominal administration 40 minutes before irradiation in a 195 mg/kg dose, the compound displayed a clearly expressed radioprotective effect in 60 percent of the cases, while death of control animals was 100 percent. The mean life span of the experimental animals was 25.6±1.99 days. The conducted studies repeatedly showed that this compound is a powerful antioxidant as well [4].

At the same time as the indicated compounds were studied, other compounds were also tested: phenyl selenium-4-phenylbutyn-2-tetrahydro-1,4 oxazine hydrochloride, phenylseleniumpropanol-2-cyclohexylamine hydrochloride, synthesized at the Institute of Chloroorganic Synthesis imeni Yu.G. Memedaliyev, Azerbaijan SSR Academy of Sciences, as well as selenium semicarbazide oleic acid. These compounds were found to be effective as radioprotective preparations, exerting protective action in 30 percent and 20 percent of the cases respectively, with 100 percent death of control animals. It is interesting to point out that the mean life span of animals, after irradiation with a lethal dose of 6.9 g, for phenyl selenium-4-phenylbutyn-2-tetrahydro-1,4-oxazine hydrochloride was 24.0±1.7. As far as selenium semicarbazide oleic acid is concerned, this compound in the given dose did not exert a radioprotective effect.

The second stage of this study consisted of finding the potential radioprotective properties of selenium-containing preparations, also synthesized at the Department of Pharmaceutical Chemistry, Ryazan Medical Institute. Repeated experiments, conducted with the indicated compounds, did not produce an encouraging action. The animals of all four studied groups died by the 30th day of the experiment. Changes in the parenchymatous organs were found during autopsy; this indicates that although these compounds do not display radioprotective efficacy, they do display a radiosensitizing property to a certain degree.

According to available literature data [1], some selenium compounds, particularly sodium selenate, sodium selenite and selenophene, display a definite radioprotective action. Apparently, this action is explained by the fact that the antioxidants, of which selenium is a representative, break the reaction chain of free radical formation and prevent destruction of the cellular organelles [9]. Some authors note that selenium compounds have a unique action mechanism that causes stabilization of the plasmatic membranes--nuclear and intracellular--and, thereby, contribute to an increased number of ribosomes in the nucleus and on the endoplasmatic network, and to an increased glycogen level in the cells.

Numerous studies have been conducted recently on the enzyme activity of lactate dehydrogenase and its isoenzymes in irradiated animals which are receiving selenium semicarbazide; these studies showed that, at the early stages of radiation sickness development, the oxidizing processes become more intense in the various cells and organs of the animals, and the administration of selenium semicarbazide and hydrochloride-1-phenyl selenium-4-phenyl-4-hexamethylene iminobutyn-2 prevents rapid injury to the functions of the mitochondria and of other organelles of the cells.

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12525

CSO: 1840/1508

BRIEF

PHARMACY CONFERENCE IN BAKU--(Azerbaijan Information Service)--The solution of the major social problem of our society, that of strengthening the physical condition of the Soviet people, depends largely on the joint efforts of physicians and pharmacists. Refinement of pharmaceutical science and the drugstore sector is inseparable from development of medical science and public health care. Modern aspects of developing and evaluating drugs are being discussed at the scientific conference which convened on 31 October in Baku. The opening remarks were made by Z. G. Guseynov, deputy minister of health of Azerbaijan SSR. The following papers were delivered: "Modern Directions of Biopharmaceutical Research" by A. I. Tentsova, director of the All-Union Scientific Research Institute of Pharmacy of the USSR Ministry of Health and corresponding member of the USSR Academy of Medical Sciences; "The Problem of Ancillary Products in Drug Technology," by Prof M. T. Alyushin, chairman of the All-Union Scientific Society of Pharmacists; "New Direction of Search for Drugs in the Class of Dicarboxylic Acid Derivatives," by Prof V. P. Chernykh, dean of the Kharkov Pharmaceutical Institute, and others. The conference is still in progress. [Text] [Baku BAKINSKIY RABOCHIY in Russian 1 Nov 84 p 3]  
10,657

CSO: 1840/121

UDC 591.3:577.153.4

EFFECT OF ORGANOPHOSPHORIC COMPOUNDS ON CHOLINESTERASE OF SEA URCHIN EMBRYOS

Leningrad ZHURNAL EVOLUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 20,  
No 4, Jul-Aug 84 (manuscript received 23 May 83) pp 416-419

SEMENOVA, M. N. and TURPAYEV, T. M., Laboratory of Physiology, Institute of  
Developmental Biology imeni N. K. Kol'tsov, USSR Academy of Sciences, Moscow

[Abstract] The goal of this study was to characterize the sensitivity of acetylcholinesterase (ACE) of sea urchin embryos towards organophosphorus inhibitors (OPI), to evaluate the ability of these agents to penetrate into the embryos and to determine whether lowered activity of ACE has any effect on the course of normal embryonal development. The experiments were carried out on two types of sea urchins: *Strongylocentrotus intermedium* and *S. nudus*, using derivatives of phosphonic, phosphoric and pyrophosphoric acids, two reactivators of the phosphorylated ACE: MINA and TMB-4, methylsulfomethylate GT-106 and specific inhibitor of butyrylcholinesterase -- tetrakisopropyl-pyrophosphamide. ACE appeared to have a low sensitivity towards OPI, whereas MINA and TMB-4 as well as the hydrophobic inhibitors GD-7, GT-106 and LG-65 inhibited its activity in embryos. The cationic OPI (GD-42, GT-165, GTS-87) did not penetrate into the embryos. Embryonic development proceeded without any noticeable changes up to the stage of the beginning of active feeding. It was concluded that the hydrophobic OPI (GD-7, GT-106 and LG-65) are most suitable reagents for the study of ACE's role in the processes of early embryogenesis of sea urchins. References 6: 2 Russian, 4 Western (1 by Russian author).

[1679-7813]

UDC: 577.3

CHANGE IN FORM OF ERYTHROCYTES UNDER INFLUENCE OF SODIUM PENTACHLOROPHENOLATE  
PESTICIDE (BY SCANNING ELECTRON MICROSCOPY)

Moscow DOKLADY AKADEMII NAUK SSR in Russian Vol 277, No 2, Jul 84 (manuscript received 30 Jan 84) pp 493-496

GENDEL', L.Ya., LIKHACHEVA, N.I., BOGONATOV, B.N., PANASENKO, O.M. and KRUGLYAKOVA, K.Ye., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] A study was made of the influence of structural modification of the intramembrane space caused by sodium pentachlorophenolate on the morphology of the plasmatic membrane of erythrocytes and their shape. Erythrocytes from ox blood were incubated with the pesticide for thirty minutes, then fixed by glutaric dialdehyde. Typical electron photomicrographs of the erythrocytes before and after exposure to the pesticide are presented. The pesticide causes changes in the morphology of the erythrocyte membrane and the shape of the erythrocytes, increasing with increasing pesticide concentration. Figures 2; references 11: 10 Russian, 1 Western.

[1604-6508]

UDC: 577.3.01+57:53(2.5)

MECHANISM OF PROLONGATION OF LIFE BY DIBUNOL (BUTYLATED HYDROXYTOLUENE)

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 277, No 2, Jul 84 (manuscript received 9 Feb 84) pp 497-500

KOL'TOVER, V.K., GORBAN', Ye.N. and MAYOR, P.S., Institute of Chemical Physics, USSR Academy of Sciences, Chernogolovka, Moscow Oblast; Institute of Gerontology, USSR Academy of Medical Sciences, Kiev

[Abstract] The influence of dibunol on two important neurohumoral regulation subsystems, the blood and adrenal cortical matter, was studied by ETR. The experiments were performed on tissues of male Wistar rats, using dibunol dissolved in saline solution containing 10% Tween-80 solubilizer, administered to the animals intraperitoneally at 10 mg per 100g body mass. Corticotropin was administered i/m at 5 units per 100g body mass for mature rats, 1 unit per 100g body mass for old rats, 1.5 hours before the animals were sacrificed. Administration of dibunol was found to have a significant influence on neurohormonal regulation subsystems. The effect of dibunol on EPR signals of adrenal cortical matter and blood was similar to that of corticotropin. Dibunol also directly interacts with blood transport proteins and consequently influences transport and concentration of hormones in the tissues. Dibunol can thus act as a stress factor. When regularly included in the diet of animals dibunol as a mild stress factor acts to train the neurohumoral system and thus increases the reliability and adaptive capability of the

organism. It is this training effect which is the basis of the geroprotector properties of dibunol. Figures 3; references 13: 11 Russian, 2 Western.  
[1604-6508]

UDC 612.73:612.467.1:615.218.1:612.014.83

#### STUDY OF 15-CROWN-5 EFFECT ON MEMBRANES OF SMOOTH MUSCLE CELLS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 30, No 6, Nov-Dec 84 (manuscript received 9 Aug 83) pp 727-730

BOGATSKIY, A. V. (Deceased), LUK'YANENKO, N. G., VONGAY, V. G., SAVENKO, T. A., TSYMBAL, I.P. and NAZAROV, Ye. I., Physical-Chemical Institute, UkrSSR Academy of Sciences, Odessa

[Abstract] The goal of this work was to study the characteristic interactions of 14-crown-5 (15-C-5) compounds with smooth muscle cells (SMC) and with model lipid membranes. Comparison of the effect of 15-C-5 on skeletal and smooth muscles showed that the latter are more sensitive to the crown ether. A conclusion was reached that the depolarizing action of 15-C-5 could be explained by the blocking of the potassium channels. The crown ether evidently does not interact with respective ionic penetrability channels. Expulsion of screening of the membrane bound calcium ions by 15-C-5 molecules could facilitate the interaction between the crown ether and acetylcholine and histamine receptors at the segment between mediator binding site and calcium ionophor of the channel. The principal property of crown ethers is formation of complexes with metal cations. Figures 3; references 15: 8 Russian, 7 Western (1 by Russian authors).

[1681-7813]

UDC 614.76:615.285.7]-07

#### HYGIENIC SUBSTANTIATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF PESTICIDE VALEXON IN SOIL

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 84 (manuscript received 15 Jun 84) pp 21-23

KUZNETSOV, A.V., Kiev Medical Institute

[Abstract] Quantitative assessment of processes of migration of the organo-phosphorus pesticide valexon in soil-water, soil-plant and soil-air systems is presented and the effect of valexon on a soil microbiocenosis is discussed. The use of the preparation presented no appreciable health hazard. The threshold concentration for constituting a health hazard was set at 1 mg/kg of soil. Valexon in concentrations below this threshold value did not enter water, air or plants coming into contact with it in concentrations exceeding the maximum possible concentration. References 5 (Russian).  
[1683-2791]

INTERACTION WITH CYTOCHROME P-450 AS A MECHANISM OF PROTECTIVE ACTION OF  
3-HYDROXYPYRIDINE DURING INTOXICATION OF ANIMALS BY DIETHYLNITROSOAMINE

Moscow IZVESTIY AKADEMII NAUK SSSR: SERIYA BIOLOGICHESKAYA in Russian No 6,  
Nov-Dec 84 (manuscript received 23 Jun 81) pp 950-953

SHULYAKOVSKAYA, T.S., ARSHINOV, V.Yu., PAKHOMOV, V.Yu., RYKOVA, V. A.,  
SMIRNOV, L.D., KUZ'MIN, V.I. and SAPRIN, A.N., Institute of Chemical Physics,  
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[Abstract] Study of antitoxic properties of some antioxidants of the 3-hydroxypyridine class during experiments on male Wistar rats (wt 180-200 g) showed that pretreatment of the rats by these antioxidants prevents the toxic effect of the hepatotropic carcinogen diethylnitrosoamine (DENA). Five compounds: 3-hydroxypyridinechlorhydrate (3-HPCH), 2,6-dimethyl-3-HPCH, 2-tertbutyl-3-HPCH, 2-tertbutyl-6-methyl-3-HPCH and 2 ethyl-6-methyl-3-HPCH were studied. Rats were placed in one of several groups with 12-18 rats in each. Group I rats were given DENA orally in a 280 mg/kg (LD<sub>50</sub>) dose. Rats in other groups received the antioxidant in a 50-100 mg/kg oral dose for 3 days and an equivalent dose of DENA on the 4th day. Antitoxic effect was determined by the number of animals surviving. The mechanism of antitoxic effect of 3-hydroxypyridines was associated with formation of their complexes with cytochrome P-450 of liver microsomes, preventing DENA metabolism and also with inhibition of free-radical reactions of peroxide oxidation of lipids in microsomes at beginning stages of DENA metabolism. Figures 2; references 8: 2 Russian, 6 Western.

[1682-2791]

CONDITIONS OF LABOR AND STATE OF HEALTH OF MACHINE OPERATORS IN CONTACT WITH PESTICIDES

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 7 Feb 84) pp 30-32

LADNOVA, G.G., DOROFEEV, V.M., OVCHINNIKOVA, I.V. and ROMASH, A.V., All-Union Scientific Research Institute for Protection of Labor in Agriculture, Orel.

[Abstract] The purpose of this work was to study the sanitary-hygienic conditions of labor and status of health of machine operators working with pesticides. The microclimate of the workplace, concentration of pesticides in the air, in smears from working clothing, protected and unprotected skin of operators and from equipment within the tractor cabin were studied. Pesticides in specimens were studied by thin-layer chromatography. The status of health of the operators was estimated on the basis of morphofunctional peripheral blood tests, as well as the level and structure of morbidity. Pesticides were found to be constantly present in the air of the workplace. Machine operators

in contact with pesticides showed no signs of anemia, altered morphofunctional indices of leukocytes, manifested as neutropenia, lymphocytosis, eosinophilia, a decrease in reserve energy substrates (glycogen and lipids) in neutrophils and myeloperoxidase activity. Morbidity studies indicate possible latent intoxication among workers in contact with pesticides. Colds, infectious-allergic diseases and gastrointestinal diseases were more frequent among machine operators in contact with pesticides. Further steps should be taken to improve the working conditions of these workers. Additional steps should be taken to improve the working conditions of these workers. Additional steps should be taken to decrease their contact with residual quantities of pesticides, including provisions of effective special clothing and special tractor cabins allowing operators to work without individual protective gear. References 7 (Russian).

[118-6508]

PHYSIOLOGY

ADAPTATION STUDIES AT ANTARCTIC STATION "MOLODEZHNAIA"

Moscow MEDITINSKAYA GAZETA in Russian 1 Jan 85 p 4

[Excerpt] On the eve of the new year, our correspondent had the opportunity of talking with the Antarctic station "Molodezhnaya." A radio telephone carried the voice of senior physician V. N. Golovin over a distance of 14,000 kilometers.

Vladimir Nikolayevich! Are you the only physician at 'Molodezhnaya'?"

"There's a whole contingent of us here. Besides me and anesthesiologist V. M. Koryukin, there are another two physician-researchers -- Doctor of Medical Sciences S. I. Soroka and Candidate of Medical Sciences Yu. A. Sidorov. They are specialists in the field of human adaptation in the Antarctic. Each of them has three Antarctic expeditions to his credit, while Koryukin and I are novices."

"What is your strong medical group working on?"

"Extensive medical scientific research aimed at studying human adaptational capabilities has been in progress at 'Molodezhnaya' for many years. Studies are in progress for the purpose of making physiological norms more precise, and testing special eyeglasses which protect against the sun's powerful ultraviolet radiation, as well as special eyeglasses which increase the contrast range of vision when illumination is weak during snowstorms and blizzards."

"And do you have to render medical care?"

"The people at our station are healthy. During periods when new contingents arrive, respiratory illnesses and sunburns of the face occur; solar radiation is very strong in the Antarctic. But that is during the period of adaptation. As for now... No, nobody is sick."

FTD/SNAP  
CSO: 1840/1722

## RESULTS OF 15-DAY TRIP WITHOUT EATING

Moscow NEDELYA in Russian No 51, 17-23 Dec 84 p 4

[Article by B. Bychkov]

[Excerpt] Participants in an unusual expedition set out on a journey with no food supplies at all, and they consumed nothing but water during the entire 15 days of their trip. "Results of this experiment can be used in practice for preparing hikers and other outdoor groups for emergency situations which force them to go without food," said Master of Sports Genrikh Ryzhavskiy and Candidate of Medical Sciences Valeriy Gurvich, the leaders of the trip. All seven of the participants in the experiment "Ekstremum-84" have now completed both a period of recovery and a three-month diet of vegetable and dairy products, and they are feeling perfectly well.

The Moscow City Hikers' Club and the editors of the magazine "Hiker" decided to conduct this experiment in order to formulate recommendations for persons who find themselves in trouble and who are forced to save themselves. Proven answers had to be obtained for such questions as how great a physical test can people endure, what distance can they travel without eating, and how much time does it take them to recover their strength afterward. The 'emergency' canoe trip along the Belaya River was the second stage of the experiment. The first "Ekstremum" took place in 1981; the voluntary 'fast' at that time lasted 14 days, in the course of which 406 kilometers were traveled on foot through forests and swamps.

"For the purpose of approximating the experiment as closely as possible to a real situation, the members of the group were chosen from people of different ages, ranging from 17 to 57 years, and different outdoors qualifications, some being novices while others were masters of sport," noted V. Gurvich, scientific director of the trip. "The only candidates who could not be considered were those people who had not received medical permission for an ordinary hiking trip. Candidate of Medical Sciences G. Babenkov and I determined each candidate's mental and physical condition and checked them with tests. The group was prepared for changes in their state of health, feelings and mental state which presumably would occur. Each member became deeply convinced that the trip could be accomplished. It was preceded by one- and two-day training hikes in areas around Moscow."

At the start of the trip, at an intermediate point (on the ninth day of the experiment) and at the finish, comparisons were made of the participants' weight, parameters of their blood pressure and heartbeat were recorded, and they underwent physical examinations. Their return to a recovery diet also was under strict supervision of medical personnel. They began with one liter of canned tomato juice and a piece of watermelon; only after a week had passed, twice a day they could eat vegetable salad, vegetable paste, buckwheat kasha, an omelet, mashed potatoes and cheese and drink milk, and only a little of these at a time. Then came another three months of vegetable-and-dairy diet. And not a single undesirable deviation was recorded in any of the participants during this entire period.

The experiment was a pure one, so to speak; not once did anyone touch the emergency supply of food products. Moreover, the participants rowed with oars 6-8 hours a day. And they had enough strength left to play volleyball during breaks!"

FTD/SNAP  
CSO: 1840/202

UDC 591.513:595.76:591.147.6.05

EFFECT OF LULIBERINE AND ITS FRAGMENTS ON TENEBRIOS MOLITOR BEETLE MEMORY

Leningrad ZHURNAL EVOLUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 12 Sep 82) pp 374-379

SHEYMAN, I. M., BALOBANOVA, E. F., MARTINOVICH, V. P., POLIKARPOVA, V. P. and SLOBODCHIKOVA, L. K., Institute of Biological Physics, USSR Academy of Sciences, Pushchino-on-Oka, Moscow Oblast; Institute of Bioorganic Chemistry, BSSR Academy of Sciences, Minsk

[Abstract] Luliberine (I) is a decapeptide with the following aminoacid sequence: p-Glu-His-Trp-Ser-Tyr-Gly=Leu-Arg-Pro-Gly-NH<sub>2</sub>. It is a neurohormone responsible for stimulation of the secretion of gonadotrophic hormones. The effect of I and of its fragments on N-terminal (p-Glu-His-Ome and p-Glu-Leu-Arg-Ome) and the C-terminal (Pro-Gly-NH<sub>2</sub> and Gly-Leu-Arg-Pro-NH<sub>2</sub>) on the memory of beetles was investigated by their behavior in a T-shaped labyrinth. The C-terminal peptides facilitated the learning process exceeding even the effect of I itself.; the central peptides had no effect and the N-terminal fragments inhibited the memory processes. Figures 3; references 10: 7 Russian, 3 Western.

[1679-7813]

UDC 591.18:577.37:594.382

PROTOENSEMBLES IN NERVOUS SYSTEMS OF HELIX POMATIA SNAIL

Leningrad ZHURNAL EVOLUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 20, No 4, Jul-Aug 84 (manuscript received 11 Jan 82) pp 425-427

KARPENKO, L. D., Scientific Research Institute of Neurocybernetics, Rostov University, Rostov-on-Don

[Abstract] Characteristics of neuronal organization of the abdominal complex of grape snail were studied as the prototypes of the ensemble structures of the brain of higher animals. Experiments were carried out on semi-intact preparations of a leg of Helix pomatia L. snail, observing the reactions of

individual nerve cells in response to electric stimulation of the nerves and of various points on the leg. The results obtained suggested that the neuronal associations have definite functional differences. These structural-functional associations in the nodal nerve systems were viewed as protoensembles of nerve cells from which functional systems are formed during the life processes of an organism assuring its adaptive behavior. An assumption was made that such an organization is the prototype of mosaic ensemble which occurs in screened structures of higher brain segments. Figure 1; references 8: 6 Russian. (1 by Western author), 2 Western. [1679-7813]

UDC 575.1:616-009.6

GENOTYPIC PRECONDITIONING OF ORGANISM REACTION TO VEGETOTROPIC DRUGS UNDER CONDITIONS OF NORMOXIA AND HIGH PRESSURE HYPOXIA

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 30, No 6, Nov-Dec 84 (manuscript received 3 Sep [?] 83) pp 692-696

ZAYTSEVA, N. Ye. and TARAKHOVSKIY, M. L., Kiev Institute of Pediatrics, Obstetrics and Gynecology

[Abstract] Genetic preconditioning of the reactions of organisms towards vegetotrophic drugs in monozygotic (MZ) and dizygotic (DZ) twins was studied under conditions of normoxia and high altitude hypoxia. Twenty-two teenagers (14-18 years old) were studied in Kiev and after 2-3 days upon arrival in the Caucasus (2300 m altitude) using 5 MZ and 6 DZ pairs. Vegetotrophic drugs were injected subcutaneously: acetylcholine chloride, adrenaline hydrochloride and histamine dichloride. It was established that changes in partial pressure of oxygen represented a significant factor determining quantitative difference in several indices characterizing specific local reactions towards the administered vegetotrophic drugs. Under these conditions, the genetic determination of phenotypic characteristics of the interaction between these drugs and the body are preserved. References 15: 9 Russian, 6 Western.

[1681-7813]

UDC 612.121.2:0.4.464:575.1

ACID-BASE BLOOD STATE DURING ADAPTATION TO HIGH ALTITUDE CONDITIONS IN MONO- AND DIZYGOTIC TWINS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 30, No 6, Nov-Dec 84 (manuscript received 3 Jan 83) pp 687-692

BEREZOVSKIY, V. A., MEL'NIK, T. A. and SEREBROVSKAYA, T. V., Institute of Physiology imeni A. A. Bogomolets, UkrSSR Academy of Sciences, Kiev

[Abstract] The goal of this work was to investigate the degree of genetic predisposition of acid-base state (ABS) of the blood during adaptation to mountainous climate. Twenty-six male twins aged 15-17 years were studied, six pair being monozygotic (MZ) and seven dizygotic (DZ). The twins were brought from Kiev to the mountains (altitude 2600 with periodic climbing to 3000 m) and the determinations were done immediately, after 20 days stay in mountains and 20 days after return to Kiev. The degree of alkalosis development varied from subject to subject but in general during the first days at high altitudes, subcompensated alkalosis was observed, then the blood pH reached normal levels. After 20-22 days, the volume of lung ventilation dropped slightly but remained above the level of lowlands. About 20 days after return to lowlands, normalization of pH, the buffer bases and standard bases was observed; type:  $\text{PaCO}_2$ , excess buffer bases and actual bicarbonate remained slightly below normal readings. Figures 2; references 21: 16 Russian, 5 Western.

[1681-7813]

UDC 612.75:612.014.42

STUDY OF SYNAPTIC TRANSFER, ACTION OF NORADRENALINE AND ATP IN INTESTINAL SMOOTH MUSCLE CELLS IN POTASSIUM-FREE SOLUTION

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 30, No 6, Nov-Dec 86 (manuscript received 14 Jul 83) pp 724-726

BAYDAN, L. V., TISHKIN, S. M. and SHUBA, M. F., Institute of Physiology imeni A. A. Bogomolets, UkrSSR Academy of Sciences, Kiev

[Abstract] Adrenergic and nonadrenergic inhibitions in intestinal smooth cells (SMC) were studied after removal of potassium ions. Analysis of experimental results indicated that there exists a calcium component during the generation of nonadrenergic inhibition synoptic potentials (ASP) and during the inhibiting action of exogenous noradrenaline and ATP. It could be assumed that introduction of calcium into a cell activates potassium conductivity is much larger than calcium conductivity, only hyperpolarizing charges of the membrane potential are discharged. Figures 2; references 11: 3 Russian, 8 Western (1 by Russian authors).

[1681-7813]

SPECIFICITY OF ANTIENTEROCYTIC CYTOTOXIC SERUM BASED ON LIGHT-OPTICAL AND ELECTRON MICROSCOPIC DATA

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 30, No 6, Nov-Dec 84  
(manuscript received 24 Jan 83) pp 701-708

BARSHTEYN, Yu. A., GANDZIY, G. P., ANISIMOVA, Yu. N., SMOLIY, L. S. and SEREBRYAKOVA, T. L., Kiev Institute of Epidemiology and Infectious Diseases

[Abstract] Light optical and electron microscopy was used in studying morphological changes (especially the erythrocytes and their organoids) in animal bodies after administration of anti-enterocytic cytotoxic serum (AECS), given to alter the reactivity of the small and large intestinal mucosa. ACS was used as a control for the specificity of AECS action. The data showed that animals receiving ACS showed changes similar to those observed with administration of AECS; the changes in mucous membrane epithelium were less expressed but there was a pronounced reorganization in other organs and stronger reaction in cellular elements of stroma. Parenteral administration of AECS caused deep morphological changes in cytoplasmic organelles of mice erythrocytes resulting in disturbance of metabolic processes. No such changes were noted with ACS although both sera led to structural changes in heterogenic protein with a definite reaction from cellular elements of interstitium. AECS may be used in modelling pathological processes in the intestines. Figures 4; references 10 (Russian).

[1681-7813]

ROLE OF NEUROPEPTIDES IN INDUCTION OF HIBERNATION

Moscow ZHURNAL OБSHCHEY BIOLOGII in Russian Vol 45, No 3, May-Jun 84 (manuscript received 20 Mar 82) pp 400-409

KRAMAROVA, L. I., KOLAYEVA, S. G., PASTUKHOV, Yu. F., ROZHANETS, V. V. and YUKHANANOV, R. Yu., Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Oblast; Institute of Biological Problems of the North, USSR Far Eastern Scientific Center, Magadan

[Abstract] The authors present a review of a literature and their own data. The study of induction of hibernation by means of neuropeptides is in a stage of data accumulation. The authors were able to show a pronounced difference in the content of DSIP-like material in the brain of hibernating and active ground squirrels as well as met-enkephalin and leu-enkephalin material. An assumption was made about the role of opioid and TRH peptides in induction of hibernation. Further work is needed in the following areas: isolation and identification of the active factors from brain and other organs of hibernating animals followed by studies of their physiological activity; studies of

seasonal variation and physiological properties of already identified neuropeptides. Figures 2; references 30: 4 Russian, 26 Western (3 by Russian authors).

[1680-7813]

UDC 612.014.561.2

PRINCIPAL PATTERNS OF FUNCTIONAL CHANGES OF HUMAN RESPIRATORY SYSTEM IN ADAPTATION TO HIGH PRESSURE

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 30, No 6, Nov-Dec 84 (manuscript received 11 Jan 84) pp 667-679

GULYAR, S. A., Institute of Physiology imeni A. A. Bogomolets, UkrSSR Academy of Sciences, Kiev

[Abstract] Results from an experimental study of physiological regulation mechanisms of the transfer of respiratory gas in the human body under increased pressure in nitrogen-oxygen are reported. In moderate pressures (up to 6.34 g/l) human oxygen system is characterized by increased rate and intensity of O<sub>2</sub> intake into alveoli, elevated PO<sub>2</sub> in alveoli and in arterial blood but decreased rate and intensity of its transport by arterial and venous blood and lower PO<sub>2</sub> in the latter. The CO<sub>2</sub> transport under hyperbaric conditions is characterized by lower elimination of CO<sub>2</sub> with blood, almost normal elimination from the lungs and increased PCO<sub>2</sub> on account of a shift of acid-base equilibrium towards respiratory acidosis. The principal respiratory mechanisms show an increased physiological-respiratory and dead volume, lowered alveolar ventilation in the lungs, slower diffusion of O<sub>2</sub> through the alveolar-capillary barrier, higher unevenness of ventilation-perfusion ratio in the lungs, lower capillary blood flow in lungs and higher blood shunting. In the pressure range 0.25-0.5 MPa the hyperbaric factors may be arranged in the following order of increasing effect: compression and temperature stress; hyperoxia; increased density, partial pressure of nitrogen and temperature of the respiratory medium; and hypodynamics. The principal hemodynamic mechanism is the retention of blood volume circulation and cardiac output. Figures 6; references 38: 27 Russian, 11 Western.

[1681-7813]

EFFECT OF BROAD-BAND CONSTANT NOISE ON SOME SYSTEMS OF ANIMAL BODY

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 84 (manuscript received  
1 Jun 84) pp 36-38

POCHOBUT, L.V., Leningrad Sanitation and Hygiene Medical Institute

[Abstract] Study of the nature of response reactions of the animal body to one-time effect of broad-band noise at the 83 decibel A level for 3 hours are described and discussed. The functional state of the central nervous system, cardiovascular system and some metabolism parameters were studied in 12 rabbits (wt 2100-2600 g). Single effect of the noise caused reduction of bioelectrical activity of the rabbit brain, especially the alpha-rhythm. The noise used caused insignificant hypertension (3.3 percent), increase of heart rate and increase of contractile capacity of the myocardium (by change of the QRS wave) but did not affect auricular or intra-ventricular conductivity. The functional shifts shown were attributed to the effect of regulation of physiological equilibrium in the system and not to any pathological reaction. It was recommended that these bodily changes in reaction to noise may be used to develop a method of individual sensitivity to noise. Figure 1; references 18: 13 Russian, 5 Western.

[1643-2791]

PUBLIC HEALTH

BLOOD DATA BANKS UTILIZED IN HEALTH SUPERVISION

Moscow MEDITSINSKAYA GAZETA in Russian 28 Nov 84 p 3

[Article by Professor K. Ivanov, chief of the Bioenergetics and Thermoregulation Laboratory of the USSR Academy of Sciences Physiology Institute imeni I. P. Pavlov, Leningrad: "Data Bank"]

[Text] At this time, medicine is not restricting its functions to the examination and treatment of man as an individual. In order to organize public health and mass prevention of diseases on a rayon-wide, city-wide and oblast-wide scale, examination data must be made available on large contingents of sick as well as healthy people.

This essentially complies with the goal of annual dispensarization [preventive medical examinations] of the entire population. An operation such as this demands the development of mass methods for the study and processing of very large amounts of information.

A medical data bank serves this purpose. Simplifying considerably, it can be described as ideally organized automated archives of medical examination data in a modern powerful computer memory base. This means that it is used not only to accumulate and store a very large collection of health information, but that it can effect complex multi-factor statistical processing of an entire body of material or individual sections of it.

If a large number of sick and healthy persons (on the order of several thousand to tens of thousands or more) undergo comprehensive examination using the majority of modern methods, then computer processing of individual examination data can help to solve a number of important practical problems. For example, methods for diagnosing various diseases can be improved, risk factors for the most widespread diseases can be determined, the effect of various occupational hazards on the body can be clarified, the sensitivity of the body to various environmental factors can be determined, etc.

It is clear, however, that examination of a large number of people using the entire arsenal of modern diagnostic methods is neither possible nor advisable. Therefore, in order to create a medical data bank and to achieve the purposes at hand, it is necessary to find a sufficiently informative simple method allowing mass examination.

Morphological and biochemical blood characteristics can be used as such a method. It is known that specific changes in the cellular makeup and biochemical parameters of the blood reflect the physiological condition of the body and serve as a most important means for diagnosing many diseases. Several studies have just appeared in the scientific literature dealing with such questions. In one of them, for example, researchers maintain that just by using representative combinations of activity values of six blood plasma enzymes, a person's age, sex, eight, type of nutrition and diastolic blood pressure can be established with rather high statistical reliability. These results by themselves do not yet have decisive significance, but they do assure that several thousand blood analyses based on 30-40 of the most important biochemical indices using the appropriate mathematical processing will give analogous physiological characteristics of an entire group as a whole and of any person from this group.

It will be possible to establish the limits of the physiological norm on the basis of statistical analysis, and to determine deviations from it as well as their causes. The presence of shifts at the normal-pathological boundary will serve as grounds for sending a person to clinic for an examination.

Immunological blood indices will be especially important for health supervision. Certain data from the general medical examination can be incorporated into individual indices, if the physician's subjective errors are ruled out. In fact, individual blood analyses are sure to go into the bank together with a series of anamnestic data.

The use of robots for biochemical blood analysis is being proposed for the future. At the present time the most perfect examples of these devices are determining up to 60 of the most important biochemical parameters in a minimal specimen amount and are entering the data into a computer. This makes it possible to fill the data bank rapidly.

How workable is the organization of the first stage of the blood data bank? The experience of our work in Leningrad indicates that a small group of mathematicians, programmers and physicians with access to a powerful computer can devise a suitable system in 1.5-2 years. Prophylactic and therapeutic institutions are responsible for filling the bank. Individual analyses include 15-25 biochemical indices.

In connection with annual dispensarization of the population, creation of these banks represents an extraordinarily important task, not requiring special financing.

The accumulation of large files of blood analysis and the opportunity for their diverse statistical computer processing will undoubtedly have great significance, not only for experienced workers but for the future development of fundamental research in human physiology and biochemistry.

12262  
CSO: 1840/1686

## LACK OF MEDICAL FACILITIES IN UL'YANOVSK SUBURB

Moscow IZVESTIYA in Russian 14 Nov 84 p 2

[Letter from N. Monakhova and A. Privalova, construction workers in Ul'yanovsk, and commentary by Zh. Mindubayev, Izvestiya special correspondent in Ul'yanovsk, under the rubric "Letters and Commentaries": "Waiting in Line for a Physician"]

[Text] [Letter] We live in a new rayon of Ul'yanovsk. We came here to build a large industrial complex. We were given an apartment. We're pleased with everything here--the huge construction project, the new apartments, and the surroundings. There's only one thing we can't make sense of--why are there such poor provisions for medical care? It's a major problem managing to see a physician. Nor is it any easier trying to buy medicine at the pharmacy, since there's only a single pharmacy for the entire rayon, and that's set up in one of the apartments of an apartment block. If a child falls ill it's a disaster--there's not a single children's hospital in the whole enormous residential area.

[Commentary] Here I stand, on the left bank of the Volga, at a huge construction site. Not far from here, a new city is experiencing the pangs of birth. The vacant land of a few years ago is now occupied by broad avenues and high-rise apartment buildings. The population is presently about 70,000. This is currently the most rapidly growing region of the city, with the youngest population and the highest birth rate. Unfortunately, this is also the region with the worst medical care.

"It's a very bad state of affairs," says A. Sergin, chief physician of the trans-Volga clinic. "The essence of the matter is, our clinic is the only one serving the area, with 800 patient consultations every shift. There is not one hospital in the rayon, nor any maternity home. According to current standards, for 70,000 residents there should be several clinics, hospitals, pharmacies, dairy kitchens and other medical facilities. Of course we're not letting the sick go unassisted. All of our physicians are severely overloaded. If someone must go into a hospital, a place is found for them in medical facilities in other rayons of the city. But they're crowded enough even without our patients, and besides, we're far from the city center, across the river.

How did it come about that a large and heavily populated new rayon of this city has practically no medical facilities? Is this due to a miscalculation on the part of the designers, or to the absentmindedness of the builders?

No, the designs specify the construction of clinics and hospitals. Medical facilities were to be put into operation at the same pace as the population moved into the new residences. By the end of 1985, a 1,100-bed hospital complex was to be opened, to include a children's hospital, three clinics handling 2,450 patient visits, six pharmacies, a children's dairy kitchen, and other necessary facilities.

It has been nearly five years since these resolutions were passed, but almost none of these plans have gone past the design stage. A lying-in hospital is still under construction, while the children's and the general hospital are still in the design stage. The six pharmacies, children's dairy kitchen, and nine distribution centers for children's food have not yet even reached the planning stage.

Why has this resolution concerning the construction of medical facilities in an industrial and residential complex not been carried out? I posed this question in the ministry to N. Semin, supervisor of Administration of Capital-Investment Construction, who represents the customer. "We're constantly being let down by the construction people at Glavul'yanovskstroy," he told us. "They are chronically behind schedule."

Deputy chief of Glavul'yanovskstroy, V. Vladimirov, had a different story: "The customer did not provide us with a design or financing. How can they have any claims on us?"

This is a clear case of Peter blaming Paul. In actual fact, both customer and construction firm are at fault. The forum was not overly zealous in arranging for financing and drawing up designs for the medical facilities, while the construction firm minimized the effort it expended by choosing from the long list of projects to be constructed those which were more profitable or "weighty."

One might ask whether the local Councils of the trans-Volga area are informed of the poor medical care in this region.

Yes, they are. The state of health care and the measures being taken to improve it were discussed at a special session of the Ublast Council of Peoples Deputies, and the necessary resolutions were passed. Some time has elapsed since then, but unfortunately these resolutions have remained no more than written documents. The oblast Council and its executive committee have not exercised their constitutional rights to demand that the construction workers and other responsible persons fulfill their direct obligations.

Now efforts are being made to find some way out of this situation. A model kindergarten has been set up at the lying-in hospital. A pharmacy and a

children's clinic have been opened up in seven apartments. It's incredibly crowded there and the working conditions are the very worst.

Only one medical facility, the 200-bed maternity home, is expected to be completed next year in the trans-Volga area. All's quiet on the construction sites.

9832

CSO: 1840/151

## IMPROVEMENT OF GEORGIAN SSR HEALTH SERVICES

Moscow PRAVDA in Russian 10 Dec 84 p 3

[Article by G. Lezhava, Minister of Health, Georgian SSR, Tbilisi: "At a Convenient Time for Everyone -- Health Services"]

[Text] I strongly believe that those who consider that a director of an enterprise is supposed to be concerned only about strictly industrial matters are mistaken. There is another question: what will contribute more to increasing the productivity of labor -- construction of another plant shop or well thought out health-improvement measures? I shall give the following example.

The administration and the party organization of the Kutaisi Automobile Plant imeni Ordzhonikidze have been doing much for equipping their medical department. It rightfully became one of the best medical establishments of the city. In the last two years, losses of working time due to illness at this enterprise were almost one third less than the average losses in this industry. It is natural that the profit from the decrease in the disease rate last year was twice as high as the expenses on the maintenance of that medical department. Its chief physician Otar Chkhobadze was one of the first in the republic to be awarded the title of USSR People's Physician.

Unfortunately, there are about twenty large medical departments operating at republic's enterprises, and many of them do not have hospitals. It is still not very easy to convince the appropriate ministers, departments and administrators that it is necessary to develop medical services.

For example, the Zestafoni Ferroalloy Plant was polluting the environment in the course of many years. There were cases of occupational diseases among its workers. However, the management was ignoring numerous instructions of the republic's medical services. The Central Committee of the Communist Party of Georgia had to interfere. With active participation of the USSR Ministry of Non-ferrous Metallurgy, purification facilities were installed in just a few months. The state of health of the plant's workers improved noticeably. Of course, this is the most important point, but let us also mention that these measures resulted also in a considerable economic effect.

It is time to understand that health services have a direct effect on the sphere of production. Here is some more food for thought: as a result of the fact that the republic achieved the country's lowest level of temporary disability, the

loss of about 900,000 man-days is prevented annually in the national economy, which ensures approximately a day's volume of industrial production.

At the present time, more and more administrators realize the necessity of active participation in health-improvement work. Large enterprises and institutions, kolkhozes and sovkhozes are organizing and equipping their medical departments, as well as reconstructing old medical facilities. On the initiative of local party and Soviet agencies, kolkhozes are using their own resources to build rural outpatient clinics in Sachkhereskiy, Goriyskiy, Telavskiy and other rayons. The Tianetskiy, Vanskiy, Samtredskiy and Tsalendzhikhskiy rayon hospitals are being reconstructed.

By using various sources of financing, the Georgian SSR was able to increase the allocations for the material and technical base of its health services in the last ten years by approximately 1.7 times in comparison with the preceding decade. The total inpatient capacity of the republic's hospitals increased almost by one and half times, and the capacity of the polyclinics almost doubled. New health centers started operating.

The republic is well provided with medical personnel: there are many more physicians and medium-level medical workers per 10,000 people than in any other republic. Due to this, the Georgian SSR is better prepared for conducting general annual prophylactic medical examinations of the population.

Outpatient polyclinics have been changed to a six-day week operation in two shifts, and there are physicians on duty on Sundays and holidays. Thus, practically every person can see a physician at a convenient time for him. Under the new conditions, medical establishments are particularly in need of scientific organization of labor. That is why the elements of scientific organization of labor are being actively introduced in our republic.

The conference of active republican party members and administrators on further improvement of health services in the light of the goals set by the party for improving prophylactic work has approved a republic-wide special-purpose integrated program in this direction. The same programs have been prepared for local health agencies.

According to the most modest calculations, our physicians examine approximately fifty million people a year now. In the future, when general prophylactic medical examination is implemented, this figure will increase by another twenty million. If we take into consideration that there will not be any more physicians than now, it is clear that it will be necessary to rationally use the available medical personnel.

This is why the city of Poti is conducting an experiment on the optimization and intensification of labor of medical workers within the framework of the All-Union program for general prophylactic examination of the population in cooperation with the All-Union Scientific Research Institute of Social Hygiene and Organization of Health Services of the USSR Ministry of Health. A specially created intersectorial association is participating in the experiment. In the course of the experiment, it was possible to increase considerably the

handling capacity of the city polyclinic and to improve the operation of other medical establishments through a number of organizational measures. All this made it possible to reduce to two thirds temporary disability of the residents and to reduce considerably stable disability. A similar experiment is being conducted in Tbilisi.

However, approximately 75% of the republic's population were examined last year. Of course, this is a lot, but it will be necessary to ensure annual examination of additional one and half million people a year. It is clear that this will require additional numbers of physicians of narrow fields of specialization, new equipment, and a mobile polyclinic for serving residents of remote mountainous areas. There also arises the question of the construction of large polyclinics. We have great hopes in the resolution adopted not too long ago regarding the acceleration of the completion of priority medical facilities projects in the republic.

Rural district services need further improvement. Much work has to be done for creating large interrayon specialized departments. And, of course, it will be necessary to involve medical scientists in practical work and to use more widely the potentialities of the polyclinics of scientific research institutes.

Much experience has been accumulated in the republic in this respect. Last year, specialists of scientific research medical institutes and departments examined more than 50,000 patients during the "Open Door Days" and during their trips to other locations. The following experiment deserves attention: a professorial consultative polyclinic was created on the voluntary service principle at the republic central clinical and children's republic clinical hospitals where professors of medical departments see patients daily according to their individual schedules.

Much has to be done also for preparing the population for general prophylactic medical examinations in order to overcome frequent reluctance of people to see a physician periodically. As it is, the physician has to examine the patient, but the patient is not obligated to see him. This is why we are planning to intensify our work on the hygienic education of the population and popularization of a healthy way of life, and to persistently explain to the working people the goals and purposes of preventive medical examinations in order to inform each person of the high humanistic sense of this initiative of the party.

10233

CSO: 1840/177

## BENEFITS FROM MEDICAL PREPARATORY SCHOOLS

Moscow VECHERNYAYA MOSKVA in Russian 3 Nov 84 p 2

[Text] Many young people who dreamed of a medical profession were unable to enroll in a VUZ. But they did not abandon their dream. Preparatory departments or, as they are also called, rabfak [workers' preparatory school], were opened at medical VUZ's for them.

This is what the dean of the preparatory department of Moscow Stomatological Institute imeni N. A. Semashko, Doctor of Medical Sciences, Professor N. D. Yushchuk told us:

The preparatory departments opened at VUZ's 15 years ago have become an important form of improved training. In our rabfak about 100 people are trained annually. Experience has shown that these young men and women, as they merge into the student environment, become actively involved in the social life of the VUZ, showing the example of good organization and efficiency. They usually become good specialists, knowledgeable, sensitive and attentive to patients.

With all this taken into consideration, we decided to enlarge enrollment this year in the institute's preparatory department. There, 250 young people referable to junior nurses caring for patients and orderlies, blue-collar and kolkhoz workers, young men transferred to the reserves from the ranks of the USSR Armed Forces will be educated. They were admitted to our institution by decision of a general meeting of collectives, in which they work or by referral of military unit [chast'] headquarters where they had served.

Applications for the daytime form of education are now being accepted and will be taken up to 20 November. The applicants will have interviews on subjects that are the most important to medicine--biology, physics, chemistry. Those who pass the tests will start classes on 1 December.

In addition to academic disciplines, the students will learn the fundamentals of medical science, become acquainted with practical work at the VUZ clinics and participate actively in public life. They will meet the leading medical scientists.

The training lasts 8 months, which is enough time to make sure that the proper route was chosen, whether they are kind enough and generous enough to serve in a difficult but noble cause.

Finals will take place in July of next year. After overcoming this hurdle, they will be enrolled at the VUZ without competition. All of the young men and women trained in the daytime preparatory department receive a grant of 40 rubles.

We also have a night department. There, studies must be combined with a job. We try to find work at the base clinics of the institute, so that these young people would become acquainted with practical medicine from their very first days and become an organic part of our collective. Students have already enrolled this year for the night department.

10,657  
CSO: 1840/116

## BRIEFS

**RESPONSE TO CRITICISM--**The USSR Ministry of Health responds to the articles "The Hospital is Overcrowded Why?" and "Pass", published 18 July and 25 August. These articles were about wise use of bed resources in the capital's hospitals. A. M. Moskvichev, chief of the Main Administration of Therapeutic and Prophylactic Aid, informed the board that an experiment in the wise use of bed resources is being conducted in a number of the country's hospitals. The Moscow Gorispolkom Main Administration of Public Health has developed and put into practice a so-called hospitalization by coupons for scheduled patients, in order to have wise use of bed resources and equal distribution of the burden among all hospitals. There are, however, unresolved problems and difficulties in the system of hospitalization by coupon. The Ministry of Health will study the experience after the experiment is over. Since 1 April, 1981 an experiment has been going on in three Moscow hospitals, concerning application of the brigade form of work organization and payment for junior medical personnel. The experiment will last until 1 January 1986, in order to determine the feasibility of broad adaptation of this form of work into practice. In addition, a number of hospitals located in various areas of the country are included in it. The basic goal of the experiment is to improve the service to patients in a hospital by the lowest number in terms of staff quotas of junior medical workers, based on application of brigade forms of work organization and payment. A number of measures have been implemented on the question of staffing medical institutions with junior medical personnel. Thus, an order has been adopted providing for admission to medical institutes of persons with a work record of no less than two years as junior medical personnel in health institutions. Moreover, supplements to "Rules for Admission to Higher Educational Institutions" have been adopted, giving significant advantages upon enrollment at the institutes to persons from the ranks of junior and mid-level medical personnel with a work record of two or three years. As far as the question of overloading hospital accommodations by VUZ faculties and clinics is concerned, special places for the educational process are provided for in new plans for major multiprofile hospitals. [Text]  
[Moscow MOSKOVSKAYA PRAVDA in Russian 29 Nov 84 p 2] 12262

**INTERNATIONAL BRAIN SYMPOSIUM--(GruzINFORM)** An international symposium just held in Tbilisi was devoted to functions of the neuroglial cells of the brain, which largely determine the mechanism of its normal activity and diseases. A Soviet national committee together with the Physiology Institute imeni I. S. Beritashvili of the Georgian SSR Academy of Sciences organized it under the aegis of IBRO, the international organization for study of the brain.

"The choice of Tbilisi as the locale for holding such an impressive meeting of scientists from different countries of the world was determined by fundamental studies of the Georgian Physiology Institute in the area of neurology," said A. Roytbak, chairman of the symposium's organizational committee and USSR Academy of Sciences corresponding member. The neuroglia occupies half of the volume of the brain, but in contrast to its other half, the nerve cells, it has been assigned an insignificant role for almost a century, since its discovery. The use of modern technology and new research methods have made it possible to establish the true role of the neuroglia. Study of the physiology of neuroglial cells is the key to recognition of as yet insufficiently studied brain diseases, and thus to their cure.

[Text] [Tbilisi ZARYA VOSTOKA in Russian 29 Nov 84 p 3] 12262

CSO: 1840/170

UDC: 613.632+614.7:66]-07.[616.1:313.13](048.8)

CHEMICAL CONTAMINANTS OF THE WORKPLACE AND ENVIRONMENT AS CARDIOVASCULAR DISEASE RISK FACTORS

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 20 Mar 84) pp 61-65

TRAKHTENBERG, I.M., FAKTOROV, I.Ye. and VERICH, G.Ye., Kiev Scientific Research Institute of Labor Hygiene and Occupational Diseases, Ukrainian SSR Ministry of Health

[Abstract] Data are presented from (primarily Soviet) publications indicating increased frequency of cardiovascular disease among workers exposed to lead, carbon disulphide, petroleum products and aniline dyes. Recent studies are also cited which indicate that environmental pollutants such as lead and pesticides increase the frequency of cardiovascular disease in the population at large, not just employees at the plants where the pollutants are produced. One major purpose of this article was to attract the attention of scientific workers and practical public health workers to the problem of further improvement of specific forms, methods and types of prevention of cardiovascular disease related to the influence of unfavorable chemical factors on the job and in the environment. References 38: 35 Russian, 3 Western.  
[118-6508]

UDC: 614.3/.4:06.063

EXPERIENCE OF ORGANIZING INTER-RAYON CENTRALIZED SANITARY-HYGIENIC LABORATORIES

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 4 Apr 84) pp 80-81

MURZOV, V.V., KARPINETS, L.L., REUS, S. M. and KHRYSTOFULOV, V.K., Ivano-Frankovsk Oblast Sanitary-Epidemiologic Station

[Abstract] Since 1976, four inter-rayon centralized laboratories have been set up in Ivano-Frankovsk Oblast to service twelve rayons. All types of sanitary-hygienic studies are performed at these centralized laboratories. This has allowed a significant improvement in the material and equipment base of the laboratory arm of public health. Special laboratory groups have been created at these centralized laboratories, performing 65,000 rubles worth of contract laboratory studies each year. The funds from these studies are used to acquire new equipment and improve laboratory facilities. The concentration of forces and equipment has allowed introduction of some elements of scientific organization of labor. However, problems still exist, including insufficient supplies of fuel and lubricants, spare parts and units. The authors call for assignment of maintenance and repair technicians to the laboratories on a permanent basis. References 3 (Russian).  
[118-6508]

CURRENT GLOBAL MALARIOLOGICAL SITUATION AND PROBLEM OF MALARIA IMPORTATION  
INTO USSR

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4,  
Jul-Aug 84 (manuscript received 14 Mar 84) pp 3-8

KÜZNETSOV, R.L. and NEUYMIN, N.I., Institute of Medical Parasitology and  
Tropical Malaria imeni Ye.I. Martsinovskiy, USSR Ministry of Health, Moscow

[Abstract] The current global situation in regard to malaria is discussed. Increased risk of infection by malaria in tropical developing countries with increased importation of malaria, including medicine-resistant strains of *P. falciparum*, from these countries into malaria-free countries was discussed with emphasis on the situation in the USSR in relation to this problem. An increase in the number of cases imported into the USSR has been recorded in recent years among both Soviet citizens and visitors from tropical, developing countries. Most imported cases of tropical malaria come from Africa while most cases of tertian malaria come from Asia. Increase of the number of cases of imported malaria in rural areas has grown from 7.5 percent of all cases in the 1960's to 29 percent in 1982. The epidemiological hazard of this situation is heightened by the fact that the predominant pathogen recorded in recent years is *P. vivax*, to which malaria carriers in the USSR are highly susceptible. This fact was confirmed by the increase in the number of cases of tertian malaria from 1 in 1974-1979 up to 32 in 1980-1982. Malaria chemoprophylaxis among Soviet citizens abroad is hampered by lack of organization. Only 21 percent of Soviet citizens abroad in 1980-1982 and suffering from malaria took antimalaria drugs regularly while abroad. Among the other sufferers there were 41 percent who took drugs irregularly and 38 percent who did not take them at all. The last group included mostly sportsmen, artists and tourists who were short-term visitors to countries in which malaria is endemic. Almost 100 percent of these persons stopped taking antimalaria drugs upon their return to the USSR or took them for only 1-2 weeks after return. The current situation in regard to imported malaria in the USSR was characterized by 1) further increase of importation of malaria into the USSR primarily by Soviet citizens which shows the ineffectiveness of malaria prevention measures by the medical service of the ministries and departments supervising these persons; 2) increasing danger of epidemics from the increasing importation of *P. vivax* from Asian countries, especially in rural areas of southern USSR; 3) inadequacy of detection and treatment measures for persons with imported malaria and 4) inadequacy of training of physicians in diagnosis, clinical course and treatment of malaria, especially the tropical and medicine-resistant forms.

References 10 (Russian).

[1675-2791]

PATIENT AND HOSPITAL

Moscow TRUD in Russian 14 Aug 84 p 2

IL'ICHEVA, Ye.

[Abstract] A number of letters to the editor have been received in response to an earlier article on the same subject by N. Stikhov. The present article prints several of these letters, plus responses from a number of ministries and departments involved in public health. One writer complains that after her mother was delivered to the hospital by an ambulance, the conditions in the emergency reception room were so poor that she took her mother back home. Others complained that in spite of tremendous advances in high technology medicine, hospitals are incapable of attending to the daily routine of proper and comfortable care of patients. Medical workers have written complaining of poor organization of work in hospitals. Others complain of poor organization of manufacture of hospital beds and other equipment.

[123-6508]

PSYCHOLOGY

INTEGRATED HUMAN STUDIES: ROLE OF PSYCHOLOGY

Moscow PRIRODA in Russian No 10, Oct 84 pp 13-20

ZADOROZHNYUK, I.Ye., Priroda correspondent

[Abstract] An interview conducted with B.F. Lomov, director of the Institute of Psychology of the USSR Academy of Sciences, has led to a further elucidation of the philosophy and trends in the Soviet approach to psychology and human studies in general. B.F. Lomov emphasized the uniqueness of man as a factor which demands an all-encompassing approach, utilizing equally fully humanistic and psychological resources. It is said that only with the advent of Marxism has man come to be regarded as the primary component of a social system whose behavior determines, and is determined by, his environment. Psychology's contribution to an understanding of human behavior is not limited to observational descriptions of responses to a given set of conditions, but involves delving into the physical and biochemical determinants of behavior. References 10 (Russian).

[199-12171]

RADIATION BIOLOGY

UDC: 577.391:663.12/14

ACTIVITY OF CATALASE AND SUPEROXIDE DISMUTASE IN ISOGENOUS STRAINS OF  
BACTERIA WITH VARYING RADIRESISTANCE

Moscow BIOLOGICHESKIYE NAUKI in Russian No 9, Sep 84 (manuscript received  
28 Mar 83) pp 30-33

VASIL'EVA, Ye.I., GONCHARENKO, Ye.N., GUDZ', T.I. and SAMOYLENKO, I.I.

[Abstract] A study was made of catalase and superoxide dismutase activity in certain isogenous strains of bacteria differing in effectiveness of DNA repair system and radioresistance. Cells of radiosensitive gram negative bacteria *E. coli* were used, as well as cells of highly radioresistant gram positive bacteria *Micrococcus radiodurans*. The cells were irradiated on a 60Co gamma installation. Catalase activity was determined by polarographic measurement of quantity of oxygen formed upon exposure to hydrogen peroxide. Superoxide dismutase activity was determined by use of a xanthine-xanthinoxidase system. Survival curves of the species are presented. The data indicate that in isogenous bacterial strains with differences in effectiveness of DNA repair system and radiosensitivity, catalase and superoxide dismutase activity do not differ significantly from those of wild type enzymes. The viability of the bacteria exposed to ionizing radiation, ultraviolet light, hyperthermia, hydrogen peroxide and other bactericidal agents is thus determined by the effectiveness of DNA repair controlling genes, particularly the gene *recA*. Figure 1; references 10: 2 Russian, 8 Western.  
[112-6508]

UDC: 577.391:547.963.3

INFLUENCE OF PROSTAGLANDIN E<sub>1</sub> ON CYCLIC ADENOSINE-3',5'-MONOPHOSPHATE SYSTEM  
AND RADIOSENSITIVITY OF B-82 CELLS CULTIVATED IN VITRO

Moscow BIOLOGICHESKIYE NAUKI in Russian No 9, Sep 84 (manuscript received  
3 Oct 83) pp 33-37

MALATSIDZE, M.A., SEROBYAN, G.A., CHURKOV, Yu.Yu. and SOBOLEV, A.S.

[Abstract] Results are presented from a study of the influence of prostaglandin E<sub>1</sub> (PGE<sub>1</sub>) and isoproterenol on the cAMP system and radiosensitivity of B-82 cells. Mouse fibroblast cells were cultivated in monolayer at 37°C without synchronization. A cell suspension was irradiated in glass test tubes on an x-ray installation at 0.5-3.0 Gr. After incubation with D,L-isoproterenol or PGE<sub>1</sub>, the cells were precipitated by centrifugation, lysed in 0.5ml 4mM EDTA and deproteinized at 100°C. Concentration of cAMP was determined in a cooled extract. The adenylate cyclase activator PGE<sub>1</sub> was found to protect B-82 cells from radiation damage. At protective concentrations, PGE<sub>1</sub> causes an increase in intracellular cAMP content. The  $\beta$ -agonist isoproterenol, which has shown radio protective properties in other experiments, was not capable of changing the radiosensitivity of the B-82 cells, probably a result of the fact that the B-82 cells have no  $\beta$ -receptors. This makes stimulation of the cAMP system of these cells by isoproterenol impossible. Figures 2; references 14: 6 Russian, 8 Western.

[112-6508]

UDC: 613.645

VISIBLE RADIATION AND ITS STANDARDIZATION IN LABOR HYGIENE

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received  
26 Mar 84) pp 13-17

ZHILOV, Yu.D. and NAZAROVA, Ye.N., Moscow

[Abstract] A series of studies has been performed by the author's group over the past ten years to establish the optimal light level for the workplace. Persons of various ages performing various types of visual work have been studied. The major functions of the visual analyzer were studied, including contrast sensitivity, visual acuity, illumination of the retina, throughput capacity of the visual analyzer and ergographic data. The increase in visual acuity with an increase in light level is related to the mechanism of pupillomotor adaptation. Shrinking the size of the pupil adds the pinhole effect to the focusing of the lens itself to improve visual acuity. It is found that the absolutely optimal level of brightness for all types of visual work is 600 cd/m<sup>2</sup>. When high precision visual work is done, decreasing the light level by 20% below the optimal reduces productivity of labor by 10%. Figures 3; references 11 Russian.

[118-6508]

UDC: 614.73-07

METHOD OF DETERMINING EXPOSURE DOSE OF GAMMA RADIATION RESULTING FROM TROPOSPHERIC PRECIPITATION OF FISSION PRODUCTS

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 8 May 84) pp 58-59

PROKOF'EV, O.N., Leningrad Scientific Research Institute of Radiation Hygiene, RSFSR Ministry of Health

[Abstract] The primary source of gamma radiation from fission products is the products which fall to the ground with precipitation. Calculations of the dose of radiation resulting from contamination with fission products are more accurate if each precipitation event is considered separately, rather than assuming even distribution of precipitation over a long period of time. The mean energy of beta radiation of  $^{40}\text{K}$  is close to that of the mixture of fission products found in nature between one day and one year after a contaminating event. This allows potassium chloride to be used to model the beta radiation from fission products which fall with natural precipitation. An equation is suggested for calculation of gamma radiation dose based on measurement of precipitation and specific activity of precipitation samples collected in cuvettes. The method allows the exposure dose of gamma radiation from tropospheric precipitation of fission products to be determined at a specific point on the terrain considering the actual discrete distribution of precipitation and actual density of fission products in each event. References 4: 2 Russian, 2 Western.

[118-6508]

UDC: 613.648:621.039.542/.544]-074

METHOD OF DETERMINING ACTINOIDS IN FAST REACTOR SODIUM COOLANT

Moscow GIGIYENA I SANITARIYA in Russian No 9, Sep 84 (manuscript received 26 Mar 84) pp 59-61

VOROB'YEV, A.M. and STARODONOVA, N.P.

[Abstract] A bismuth-phosphate method was used to estimate the degree of alpha contamination of the sodium heat-transfer medium used in fast-neutron reactors. The method is based on coprecipitation of radionuclides of tetravalent elements on Bi phosphate from a nitric acid solution with subsequent measurement of alpha activity in a solid-state scintillator. The method allows estimation of the content of actinoids except U in the sodium coolant of certain fast neutron reactors. The content is found to vary with operating time over a range of three orders of magnitude. However, even after long operating periods, the actinoid content remains quite low, indicating the good sealing of fuel elements and possible precipitation of actinoids in the cold trap and on the surfaces of first loop equipment. References 4 (Russian).

[118-6508]

SOME DATA AND ASPECTS OF COMPARATIVE STUDY OF BIOLOGICAL EFFECT OF EXTERNAL IRRADIATION AND INTERNAL IRRADIATION

Moscow IZVESTIY AKADEMII NAUK SSSR; SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 84 (manuscript received 5 Mar 84) pp 946-949

DEDOV, V.I., Central Institute for Advanced Training of Physicians, USSR Ministry of Health, Moscow

[Abstract] Mongrel rats (600, 3 months old) underwent whole-body gamma-irradiation (1 Gr  $^{60}\text{Co}$ ) and internal irradiation by radioactive compounds  $^{75}\text{Se}$  and  $^{35}\text{S}$ , which spread relatively uniformly in the body. The compounds were injected intravenously in a single dose in quantities ensuring a whole-body dose of 0.5 Gr and up to 1 Gr in the critical organs (liver and kidneys) and endocrine glands. Biological effect of irradiation was judged by long-term (1, 2 weeks, 1, 3, 6, 9, 12, 18 months) complex studies of the state of the neuroendocrine system. Remote disturbance of the neuroendocrine system depended largely on the degree and dynamics of formation of remote radiation pathology due to disturbance of hormonal homeostasis. Internal irradiation caused by intravenous injection of the radioactive compounds was more effective in inducing biological effects than was whole-body gamma-irradiation in equivalent absorbed dose. Figures 3; references 8 (Russian).

[1682-2791]

VETERINARY MEDICINE

UDC 619:576.807.7:616.981.42:636.22/.28

DISTRIBUTION OF ANTIBODIES AMONG IMMUNOGLOBULIN CLASSES IN CATTLE WITH BRUCELLOSIS

Moscow VETERINARIYA in Russian No 11, Nov 84 pp 29-30.

SAYDULDIN, T.S., Semipalatinsk Institute of Veterinary Medicine

[Abstract] Several serologic procedures were used to monitor antibody response in cattle in response to naturally acquired brucellosis. The study revealed that antibody activity was detected in IgG<sub>1</sub>, IgG<sub>2</sub> and IgM immunoglobulins, with most animals showing antibody activity limited to the two IgG subclasses. The Coombs reaction was most efficient in detecting IgG<sub>2</sub> antibodies, while the conglutinin binding test was equally efficient in the case of both IgG subclasses. The IgM activity was readily detected by the standard Coombs test.

[1706-12172]

MOBILE EXHIBIT ON 'ACHIEVEMENTS OF SOVIET SCIENCE IN PREVENTION OF VIRAL DISEASES IN ANIMALS'

Moscow VETERINARIYA in Russian No 11, Nov 84 pp 78-79

BEZBOZHNAЯ, L.P.

[Abstract] A mobile exhibit on the "Achievements of Soviet Sciences in the Prevention of Viral Diseases in Animals" has been jointly organized by the Main Veterinary Administration of the USSR Ministry of Agriculture and the "Veterinariya" pavillion of the USSR VDNKh [park in Moscow devoted to exhibits of achievements of the national economy]. The exhibit plans to tour Kiev, Kishinev, Riga, Tallin, Vilnyus, Tbilisi, Leningrad, Kuybyshev, Novosibirsk and other Soviet cities. The exhibit includes 32 displays, including a stand prepared by the All-Union Scientific Research Institute of Foot-and-Mouth Disease on detection and identification of antibodies in the sera of animals infected with FMD virus. The State Control Institute for Veterinary Preparations has provided a display on improved immunization in cattle, which provides colostral protection to calves for 5 months, and

another one dealing with a vaccine for duckling protection. In addition, the State Control Institute has developed a dry, inactivated vaccine against rabies. Scientists of the All-Union Scientific Research Institute of Virology and Microbiology have provided a simple and inexpensive method for per os immunization of piglets against plague and Aujeszky's disease, while scientists of the Moscow Veterinary Academy included a display on the diagnosis and management of infectious bronchitis in chickens.

[1706-12172]

VIROLOGY

UDC 619.576.858.73:576.807.4:636.597

MORPHOLOGY AND MORPHOGENESIS OF FOWL PLAGUE VIRUS

Moscow VETERINARIYA in Russian No 11, Nov 84 pp 26-29

SIMONOVA, E.G., KUROCHKA, M.V., SERGEYEV, V.A., MISHCHANIN, V.A. and ZHESTEREV, V.I., All-Union Scientific Research Institute of Veterinary Virology and Microbiology

[Abstract] Electron microscopic studies were conducted on the morphology and morphogenesis of fowl plague virus (FPV) adapted to chick embryo cells. Basically, most virions were spherical in form with diameters in the 150-250 nm range. The capsid and envelope were well delineated, as well as pentagonal capsomeres. Morphogenetically the virus behaved as a typical herpes virus, with immature forms of FPV initially formed in the nucleus, subsequently acquiring a supercapsid membrane in the cytoplasm. Figures 7.  
[1706-12172]

NEW BIOTECHNOLOGY AND CREATION OF PREPARATIONS FOR DIAGNOSIS AND PREVENTION OF VIRAL INFECTIONS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84  
(manuscript received 21 Aug 84) pp 45-48

KUKAYN, R.A., Institute of Microbiology imeni Avgust Kirkhenshteyn, Latvian SSR Academy of Sciences

[Abstract] Studies are proceeding at the author's institute on introduction of the HBV genome into animal cells using a constructed plasmid which carries the HBV genome in tandem. Lines of embryonal human fibroblasts have been obtained by transfection of a plasmid carrying HBV DNA, producing the hepatitis B virus surface antigen. The hybrid cell lines produced secrete monoclonal antibodies in quantities sufficient for preparative isolation of antibodies to be used as diagnostic specimens. The creation of synthetic vaccines, chemically synthesized peptides carrying antigen determinants, is quite promising. These vaccines have no side effects since they contain no additional proteins. Cloning of HBV has allowed determination of the full

sequence of amino acids making up the polypeptide carrying HBsAG. Special computer programs were used to predict which amino acid groups are inside, which on the surface of the polypeptide molecule, after which the peptides were chemically synthesized. One shortcoming of the synthetic peptide vaccines is their low immunogenicity. References 9: 2 Russian, 7 Western.  
[1627-6508]

UDC: 576.858.75.097

CHEMOTHERAPY OF VIRAL INFECTIONS AND PROBLEM OF DEVELOPMENT OF VIRAL RESISTANCE TO CHEMICAL PREPARATIONS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84  
(manuscript received 14 Nov 83) pp 49-55

INDULEN, M.K. and KALNYNYA, V.A., Institute of Microbiology imeni Avgust Kirkhenshteyn, Latvian SSR Academy of Sciences

[Abstract] Chemotherapy of viral diseases is a growing and important branch of medicine, particularly for viral infections such as herpes, influenza and hepatitis for which development of vaccines is difficult, as well as serious infections such as arenavirus infections and hepatitis for which treatment of those already infected is needed. The main problem in viral disease chemotherapy is creation of effective antiviral drugs based on compounds which selectively and specifically suppress the reproduction of viruses without harming vital processes in cells or systems of the human body. There are as yet few effective chemotherapeutic agents for viral infections and medical practice requires the discovery and introduction to chemical practice of new, effective compounds specifically inhibiting the reproductive cycles of viruses. Viral resistance to inhibitors has been found to be transmitted through many passages to subsequent viral generations. Viruses have been developed by exposure to inhibitors which are actually inhibitor dependent, requiring the presence of large quantities of the inhibitor to reproduce. Very little is known concerning the mechanisms of viral reproduction which form the basis of viral resistance and dependence. It has been found that the simultaneous use of two inhibitors with different antiviral mechanisms greatly increases antiviral activity and reduces the probability of development of inhibitor-resistant mutants. References 43: 20 Russian, 23 Western.

[1627-6508]

CONFERENCES

ALL-UNION APPLIED SCIENCES CONFERENCE ON "PREVENTION OF NATURAL FOCAL INFECTIONS"

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian  
No 4, Jul-Aug 84 pp 86-87

[Article by A.I. Dyatlov]

[Text] An applied sciences conference on "The Prevention of Natural Focal Infections", organized by GUKI [expansion unknown] of the USSR Ministry of Health and the Antiplague Scientific Research Institute of the Caucasus and Transcaucasus, was held in Stavropol' on December 6-8, 1983. Two hundred and sixty-four specialists from scientific research and sanitary-epidemiological institutions of the public health system and several other departments from thirty-six cities around the country took part in the Conference. Four hundred and eleven reports were presented at the Conference, the abstracts of which were published in two volumes (The Prevention of Natural Focal Infections, vol. 1, 2. Stavropol', 1983). Twenty-five reports specially prepared for this conference were presented at the plenary sessions.

V. P. Sergiev and Yu. M. Fedorov noted that despite the progress made in the study and prevention of natural focal and zoonotic infections, the epizootiological situation for the majority of such infections has remained a matter of concern. This called for greater efforts in future research into the incidence, epidemiology and prevention of such infections.

After analyzing the present epidemiological situation regarding natural focal infections, V. V. Kucheruk noted that, paralleling the growth in the country's urban population, the primary increase in the incidence of natural focal infections occurred among city dwellers. This was due to the urban population's increased contact with the countryside as a result of greater opportunities for excursions and relaxation in the country and for tending suburban vegetable plots.

The report of L. N. Klassovskiy noted that the main direction of research into the microbiology of the plague was clarification of the geographical variability of its pathogens, the study of its L-form and conservation problems up to the interepizootic phase. Research into the variability of the vaccinal strain EV in Mongolian marmots has not been completed. There is no fundamentally new research on the changeability of plague microbe

prior to a condition which cannot be distinguished from the pseudotuberculosis pathogen. In order for research to be effectively completed it will be necessary to develop high-quality nutrient media prepared from inexpensive nonnutritive raw materials.

I. S. Solatkin devoted his report to reviewing the progress made in the study of the mechanism of the enzootic nature of the plague. A vast amount of data is being gathered which demonstrates a lack of continuity in the illnesses of the carriers. At the same time, the examination of alternative hypotheses and the search for essentially new facts are not being pursued to the extent they might.

P.I. Anisimov noted that the greatest progress in the study of the genetics of the plague microbe has been the discovery of its own plasmids and the use of transposition in their study. It is now possible to transfer plasmids between plague microbes and their close relatives, the pathogens of pseudotuberculosis and intestinal yersiniosis. This development may be of particular interest in the solving of several problems concerning the enzootic nature of the plague.

In their reports, P. Ye. Hayden and M. I. Shilov stated that, as a result of both targeted efforts concerning several natural foci of plague and land development, the incidence of the disease has been significantly diminished. In recent years, active prevention has to a certain extent moved away from an emphasis on early prevention toward a preference for zonal eradication of carriers and transmitting agents.

On the basis of new data, A. I. Dyatlovym gave several suggestions for more precisely defining the concept "natural focus of plague", and Yu. K. Aigelis presented material on the spatial structure of foci.

After presenting the results of research on the natural focality and prevention of tularemia, V. G. Pilipenko reviewed in detail several generally accepted viewpoints which, in his opinion, are supported by unsound reasoning. I. F. Taran stressed that brucellosis in small-horned cattle had been eradicated in a significant area of the country and that the number of farms sanitized against brucellosis of large-horned cattle continued to increase. This progress had a positive effect on the epidemiological situation with regard to brucellosis. Yu. G. Chernukha noted that the urgency of the problem of leptospirosis in the USSR was caused by the wide dissemination of natural and anthropogenic foci and by increases in the incidence of disease and number of cases of leptospirosis icterohemorrhagica which require greater attention from the public health departments for leptospirosis.

N. P. Buravtsevaya suggested ways for improving the methods of prevention of Siberian ulcer. A. I. Goncharov described the role of transmitting agents in disseminating particularly dangerous infections.

A Young Scientist Section participated in the Conference. They presented nine reports on the urgent issues of genetics, immunology and the microbiology of the pathogens of infections. Their reports were highly praised by the leading specialists.

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## PHARMACOLOGY SYMPOSIUM

Moscow MEDITINSKAYA GAZETA in Russian 30 Nov 84 p 3

[Article by Professor A. Kudrin: "Symposium on Pharmacology"]

[Text] The first All-Union symposium on "The Pharmacological Correction of Oxygen-Dependent Pathological Conditions" has been held. It took place at quarters of the USSR AMN [Academy of Medical Sciences] All-Union Scientific Center for Surgery.

A new method of prevention and treatment of hypoxic and ischemic pathology of the heart and other organs with antioxidants--selenium compounds; vitamins E, R, and S; dibunol and others--was substantiated in the reports of leading scientists. Also validated was the necessity, in acute ischemia and myocardial infarction, of using a complex of metabolic resources, in particular those resources that increase energy production by glycolytic means (for example, hexophosphate of succinic acid and malic acid). The benefit of administering combined medications, each of which regulates key links in the pathological and compensator processes, has been proven.

The expedient independent formation of two new pharmacological classes, anti-hypoxants and antioxidants, was recognized. A principle was formulated for combining the application of antioxidants and antihypoxants with the resources of specific therapy. It was also resolved to use the generic term "pharmacological regulation", and to use the term "pharmacological correction" only as a different designation for correcting a dose or a scheme for the application of preparations.

12461

CSO: 1840/1670

BRIEF

INTERNATIONAL MEDICAL WORKERS' SYMPOSIUM--(GruzINFORM) New methods in the diagnosis and treatment of diabetes, and problems of environmental pollution and the preservation of human health are being discussed by participants at the International Symposium that opened in Tbilisi at the Railroad Clinical Hospital imeni N. Kakhian. Representatives from the Austrian firms Miles and Tek-Med, Il and Novo (Denmark) and Medlabora (Switzerland) are participating in the work of the symposium organized by the USSR State Committee on Science and Technology, the country's Ministry of Health, the Cardiology Institute's Republic Center of Radioimmunological Diagnosis of the Georgian Ministry of Health and the medical service of the Transcaucasian Railroad. The newest instruments and medical equipment from a number of foreign firms for the diagnosis of various diseases and the control of environmental pollution were demonstrated at the symposium. O. Cherkeziya, deputy chairman of the Georgian SSR Council of Ministers participated in the work of the symposium. [Text] [Tbilisi ZARYA VOSTOKA in Russian 26 Oct 84 p 3] 12262

CSO: 1840/170

## BRIEFS

IMMUNOLOGY CONFERENCE IN TASHKENT--An All-Union Scientific Conference on problems of modern immunology was held in Tashkent. More than 200 scientists from the Soviet Union and also from the United States and the People's Republic of Bulgaria participated in it. A. M. Khadaybergenov, Uzbek SSR Minister of Health, opened the conference. Three sections worked within the framework of the conference: evaluation of the immune status, recent aspects of immune correction and regulation of immunogenesis. The lectures and the course of the discussion showed that a number of mainly new problems related to the needs of applied medicine are proposed for basic and clinical immunology. The problem which lay at the center of attention of the conference were further study of the functional mechanisms of the immune system, development and improvement of methods enabling the immune status of man to be evaluated for the purpose of diagnosis, prophylaxis and treatment of diseases caused by its affection, an attempt to diagnose diseases of the immune system and the immune-correcting therapy of its damaged components. [By A. Kolobov] [Text] [Moscow MEDITSINSKAYA GAZETA in Russian 2 Nov 84 p 3] 12410

SOVIET-JAPANESE RENAL SYMPOSIUM--Baku--A Soviet-Japanese symposium, concerned with problems of treatment of patients with kidney failure by means of hemodialysis and hemosorption, was held in Baku. The participants in the meeting compared experiments and planned further cooperation in the future. Representatives of Japanese firms producing apparatus for treatment of uro-nephrological patients demonstrated new models of apparatus for hemosorption and hemodialysis (the latter with a computer system). [By M. Marinina] [Text] [Moscow MEDITSINSKAYA GAZETA in Russian 21 Nov 84 p 4] 12410

## BRIEF

ROBOT FOR CELL CULTURE--A "Tsellotron", the first device in the USSR for controlled culture of cells in an artificial medium, was developed for experimental production at the Problems of Oncology Institute imeni R. Ye. Kavetskiy of the Ukrainian SSR Academy of Sciences together with the Institute of Biological Physics Institute of the USSR Academy of Sciences in Puschino. The robot operates on an automatic system. It is provided with a miniature "mechanical arm" which replaces the tedious work of researchers. It regulates the growth of cell cultures, the gaseous composition of the medium, the temperature and the acid-base equilibrium. The robot has a special device for televised morphometric analysis of cell cultures. It can be used in biotechnology for the production of vaccines with definite medicinal actions. Under video control, samples are transferred from the cultivator to a special microscope. The results of the transformation of the cells are indicated in a numerical display. A possible subsequent step is the computer analysis of information and the precise automatic correction of cell multiplication in a closed cycle. [By Yu. Vilenskiy, candidate of medical sciences] [Text] [Moscow MEDITINSKAYA GAZETA in Russian 6 Nov 84 p 2] 12410

BIOLOGICAL QUESTIONS AT A SESSION OF PLENARY MEETING OF USSR ACADEMY OF SCIENCES (SECTION OF CHEMICAL-TECHNOLOGICAL AND BIOLOGICAL SCIENCES, PRAESIDIUM OF USSR ACADEMY OF SCIENCES)

Moscow ZHURNAL OБSHCHEY BIOLOGII in Russian Vol 45, No 3, May-Jun 84 pp 429-430

VYSHESLAVOVA, M. Ya.

[Abstract] A Plenary Session of the USSR Academy of Sciences was held on 21 Dec 83 in Moscow; it dealt with results of the June 83 Plenary Session of the CC CPSU and with acceleration of scientific-technical progress in national economy. Academician Yu. A. Ovchinnikov opened the session noting that many important problems were being solved in 1983 in agriculture, health, chemistry, machine construction, etc. A new branch of science was created -- biotechnology -- which is rapidly entering into agriculture, food industry and medicine. Academician of the All-Union Academy of Agricultural Sciences imeni Lenin, A. A. Nikonorov discussed advances in agriculture noting new breeds of grain and cattle which were developed and stressing the need for improvement in the professionalism of the scientific cadres. Chief Scientist, Secretary of the USSR Academy of Sciences Praesidium, Academician G. K. Skryabin, stressed the importance of the problem of food production for the population by utilization of microorganisms, yeasts, etc. A. A. Bayev, academician-secretary of the Division of Biochemistry, Biophysics and Chemistry of Physiologically-active Compounds at the USSR Academy of Sciences, discussed future biotechnological studies and their importance in agriculture. [1680-7813]

THIRD ALL-UNION CONFERENCE ON AMINO ACIDS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84 pp 127-128

KRISTAPSONS, M.

[Abstract] The third All-Union Conference on Amino acids was held in Yerevan 23-25 April 1984, involving over 200 researchers from 57 scientific organizations and plants from 25 cities of the Soviet Union. The work of the

conference was conducted at five sections: microbiological methods of synthesis of amino acids; enzymatic methods of synthesis and separation of amino acids; chemical methods of amino acid synthesis; production of amino acids by hydrolysis; and isolation and purification of amino acids. The difficulties involved in intensification of research in the area of creation of highly productive strains of microorganisms were discussed in a number of reports. Traditional methods of selecting producers were based on the selection of mutants. A basically new approach to selection of microorganisms for production of amino acids is by methods of gene engineering, by amplification of key genes responsible for biosynthesis. A method of determining amino acids by liquid amino acid electrodes has been developed at Gor'kiy University imeni N. I. Lobachevskiy. Continuous monitoring of the process of formation of lysine by measurement of the redox potential with depolarization of platinum measurement electrodes has been achieved at the Institute of Microbiology imeni Avgust Kirkzhenshteyn. In contrast to other methods, the new method allows operation with steam sterilization of biological reagents.

[1627-6508]

#### NONTRADITIONAL FEEDS FOR AGRICULTURAL ANIMALS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84 pp 131-133

KLINTSARE, A. and RAUTINYA, Dz.

[Abstract] The first Soviet-Czech symposium on the use of nontraditional feeds for agricultural animals was held in Uzhgorod 10-12 April 1984, involving some 400 representatives of 12 Czech and 28 Soviet scientific research institutes. The following major themes were included in the program of the symposium: methods of increasing the nutrient value of straw; wood fiber and plant products; wastes of the milk, meat and leather industries; bioconversion of feeds; enzyme preparations, zeolites and feed additives; and mineral additives, the technology of utilization of nontraditional feeds in animal husbandry. A. A. Rensevich of the Central Scientific Research and Planning-Technological Institute of Mechanization and Electrification of Animal Husbandry in the Southern Zone of the USSR reported insufficient satisfaction of the requirements of animal husbandry for protein. This makes the introduction of solid phase fermentation of cellulose-containing wastes by fungi producing high protein gases rich in essential amino acids quite promising. Experiments were performed on the effectiveness of using straw and barley husks enriched with protein by microscopic fungi. The report of V. I. Gnoyevaya of the Scientific Research Institute of Animal Husbandry of the Forested Steppe and Forested Regions of the Ukraine noted the significance of the structure of physical properties of straw in evaluating the technology for its processing. A report by A. R. Val'dman of the Institute of Biology, Latvian Academy of Sciences discussed bioconversion of the products of photosynthesis and their biological value. M. Ye. Beker and others of the Institute of Microbiology imeni Avgust Kirkzhenshteyn noted that fermentative juice, the product of mechanical fractionation of the green mass of plant obtained by anaerobic fermentation of green juice by a technology development at the

Institute, can serve as a source of protein, vitamins and minerals. S.S. Kas'yan and L. G. Shaprenko of the Central Scientific Research and Technological Institute of Mechanization and Electrification of Animal Husbandry in Zaporozh'ye discussed the desirability of introducing protein green concentrate obtained from the green mass of lucerne to starter combination feed for calves in powder form.  
[1627-6508]

#### MINI AND MICROCOMPUTERS AND LOCAL AREA NETWORKS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 84 pp 134

INDULEN, I. and VIYESTUR, U.

[Abstract] The first working conference on mini- and microcomputers and local area networks was held in Jurmala 28 and 29 April 1984. The conference discussed the following main problems: creation of automated scientific research systems, local area networks of mini- and microcomputers, interactive machine graphic systems. The purpose of the conference was to activate work on these themes and standardization of hardware and, particularly, software. The ALISA adaptive hierarchical network architecture is reported to have a number of advantages including high effectiveness, possibility of operation with various types of hardware and economical utilization of memory. Mini- and microcomputers have been effectively used in automated planning systems. One important component of both automated scientific research systems and automated planning systems is computer graphics. The DISKROE graphic display system can utilize both interactive graphic displays and plotters.  
[1627-6508]

MISCELLANEOUS

BRIEFS

INSTRUMENT TO OBTAIN MAGNETOCARDIOGRAMS DEVELOPED--The Institute of Terrestrial Magnetism, Ionosphere and Radiowave Propagation has developed a method of obtaining magnetocardiograms to depict the weak magnetic fields created by the heart. Magnetocardiograms can serve as an aid or as an independent means for diagnosing the state of a person's heart and cardiovascular system. A major advantage is that it avoids the needs for electrodes to be attached to the body. One or two prototypes of the instrument have already been tested in Moscow hospitals. Tests have also been carried out on taking magnetograms of the work of the brain. [Summary] [Moscow SECOND PROGRAM in English 0730 GMT 18 Jan 85]

CSO: 1840/186

UDC: 543.51:543.8+54.07

## EXTRACTION OF IONS FROM SOLUTIONS AT ATMOSPHERIC PRESSURE; MASS SPECTROMETRIC ANALYSIS OF BIOORGANIC SUBSTANCES

Moscow DOKLADY AKADEMII NAUK SSR in Russian Vol 277, No. 2, Jul 84 (manuscript received 29 Sep 83) pp 379-383

ALEKSANDROV, M.L., GALL', L.N., KRASNOV, N.V., NIKOLAYEV, V.I., PAVLENKO, V.A. and SHKUROV, V.A., Institute of Analytic Instrument Building, USSR Academy of Sciences, Leningrad

[Abstract] A method was developed for extraction of dissolved ions at atmospheric pressure allowing production of mass spectra of low volatility and thermally-unstable bioorganic substances with a controlled degree of fragmentation or clustering of quasimolecular ions. By controlling the type of mass spectrum, the experimenter can obtain unique information on molecular weight, structural specifics of compounds, interaction of ions with neutral molecules in the solvent, as well as the kinetics and mechanism of the ion-molecular reaction. The key is an ion source developed at the authors' institute consisting of a metal capillary which injects a solution into a system of diaphragms forming a gass dynamic jet. By increasing the voltage difference across the diaphragms the device breaks up cluster ions and yields mass spectra consisting only of quasi-molecular ions. Further increases in voltage yield ion fragment spectra describing the structure of the molecules. This method of obtaining ions directly from the liquid phase allows mass spectrometric analysis of thermally unstable compounds which are difficult to volatilize without preliminary chemical protection of polar and labile groups, yielding information both on molecular weight and on the structure of the substance studied. The method, called ERIAD, satisfies the major requirement for an interface between a liquid chromatograph and a mass spectrometer. Figures 4; references 6: 1 Russian, 5 Western.

[1604-6508]

UDC 591.1

EFFECT OF PERMANENT MAGNETIC FIELD ON EMBRYOGENESIS OF EDIBLE SNAIL

Moscow IZVESTIY AKADEMII NAUK SSSR; SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 84 (manuscript received 16 Nov 83) pp 942-945

ZAKHAROV, I.S., BALABAN, P.M. and KUZNETSOV, A.N., Scientific Research Institute for Biological Testings of Chemical Compounds, Kupavna

[Abstract] Effect of a permanent geomagnetic field on snail embryogenesis was studied by determining the effect of highly attenuated (10-fold) and amplified (450 and 1000 oersteds intensity) magnetic fields on *Helix lucorum* L. Weight of individuals and embryo mortality at the moment of hatching were used as indicators of development. No significant differences in mortality in the experimental group and the control group were found. Mean weight of the newly-hatched snails was greatly reduced by the attenuated field and in the field of 1000 oersteds intensity, while a slight mean weight change in snails developing in a 450 oersteds field intensity was unreliable. Standard deviation of weight of the snails was significantly different in the experimental and control groups under all field intensities. Absence of changes in embryonal mortality and in hatching periods in the experimental and control groups was assumed to be due to the failure of field intensities used to impair basic processes of embryonal development while weight loss of snails in the attenuated field and under 1000 oersteds field intensity was attributed to reduction of intensity of metabolic processes. Figures 3; references 7: 5 Russian, 2 Western.

[1682-2791]

UDC: 594

SURVIVAL OF LIMNAEA STAGNALIS EXPOSED TO COPPER IONS

Kiev VESTNIK ZOOLOGII in Russian No 5, Sep-Oct 84 (manuscript received 7 Jun 82) pp 79

SHAKHMAYEV, N.K., Chelyabinsk Pedinstitute

[Abstract] A study was made of the influence of copper in the presence of manganese, iron, zinc and cobalt on the survival rate of *Limnaea stagnalis*. The mollusks were collected from the Miass river in the Chelyabinsk area and placed in 5 mg/l solutions made from the sulfates of the corresponding metals in tap water at 16-20°C for 30 days. In water containing 5 mg/l  $\text{CuSO}_4$ , the mollusks survived to 5 days, at 10 mg/l -- 2 days. Of all of the combinations of  $\text{CuSO}_4$  with sulfates of other metals which were tested, the most toxic was  $\text{CuSO}_4 + \text{ZnSO}_4$ , the least toxic was  $\text{CuSO}_4 + \text{MnSO}_4$ . The sequence of increasing toxicity was  $\text{Cu} + \text{Mn} - \text{Cu} + \text{Fe} - \text{Cu} + \text{Co} - \text{Cu} + \text{Zn}$ .

[1021-6508]

UDC: 598.822:591.13:594(477.46)

TERRESTRIAL MOLLUSKS IN DIET OF STARLING NESTLINGS

Kiev VESTNIK ZOOLOGII in Russian No 5, Sep-Oct 84 (manuscript received 21 Jan 83) pp 86-88

KORNYUSHIN, A. V., PETRUSENKO, A.A. and SMOGORZHEVSKIY, L.A., Kiev University; Institute of Zoology imeni I.I. Smal'gauzen, Ukrainian SSR Academy of Sciences

[Abstract] A study of the diet of starling nestlings in Kanevskiy preserve was undertaken in 1971-1979. Starling nestlings there are regularly fed terrestrial mollusks, but the latter do not always constitute substantial components of their diet. Mollusks represented 3.3% with respect to species, 1.6% with respect to individual specimens, the figures being higher for the first brood the first year than for the second. In most cases where mollusks were found, only one specimen was present in a sample, less frequently 3 to 5, only a very few times representing more than half of the sample. The distribution of mollusks indicated significant differences in hunting habits of the parent starlings. A list is presented of mollusk species which were found. The smaller number of mollusks fed to the second brood was explained by the fact that, for the invertebrates, the weather conditions during the time of the second brood are less favorable. References 6 (Russian).  
[1021-6508]

CSO: 1840

END